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COMPLIMENTS OF

CHARLES LEHLBACH,

MEDICAL OFFICER OF HEALTH,

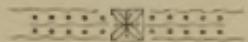
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# ANNUAL REPORT



## Health Department



CITY OF NEWARK, N. J.

1894.

53877

NEWARK, N. J.  
HEINZ LITHO. AND PRINTING CO.,  
193, 195, 197 Halsey Street,  
1895.



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CITY OF ORANGE TOWNSHIP

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2008-2009

MAP  
OF  
THE CITY OF  
**NEWARK**  
STATE OF  
**NEW JERSEY**

Typhoid Fever and Wells.

- *Infected Human* acquired from *Asm. sp.*, *ASD*, in *Asm. sp.*, *ASD*.
  - *Asm. sp.* - - - - - *Infected Human*, in *Asm. sp.*, *ASD*.
  - *WdR*.

*Applicant:* ERNST R. BIFFLER,

www.Neuro-psychotherapy.com/psychology-of-therapeutics-for-metabolic-disorders

... können und müssen zu den Spezialisierungen und Kompetenzen der Berufe

John Muir  
Naturalist

The remaining eleven of equal duration are given below in

the right-hand side, and kept near, and in the right-hand

For more information about the study, please contact Dr. Michael J. Koenig at (314) 747-2100 or via email at [koenig@dfci.harvard.edu](mailto:koenig@dfci.harvard.edu).

For more information about the study, please contact Dr. Michael J. Koenig at (314) 747-2000 or via email at [koenig@dfci.harvard.edu](mailto:koenig@dfci.harvard.edu).

For more information about the study, please contact Dr. Michael J. Koenig at (314) 747-2146 or via email at [koenig@dfci.harvard.edu](mailto:koenig@dfci.harvard.edu).





**MAP  
OF  
THE CITY OF  
NEWARK  
IN  
THE STATE OF  
NEW JERSEY**

Typhoid Fever and Wells.

- Definitive literature reevaluated from Dec., 1948, 1952, to June, 1948, 1953.  
— — — — — Dec., 1948, 1952; to June, 1948, 1953.

M A P  
OF  
THE CITY OF  
**NEWARK**  
STATE OF  
NEW JERSEY

Typhoid Fever and Wells.

Map showing Typhoid Fever cases from Dec. 1st, 1891, to Dec. 31, 1894.  
— Cases — — — Deaths, 1891 to June 30, 1894.

Appletons' — New York.

This map shows the locations of typhoid fever cases and deaths in Newark, New Jersey, from December 1, 1891, to December 31, 1894. The map includes the city of Newark and parts of surrounding areas like Elizabeth and Union City. The legend indicates that solid dots represent typhoid fever cases and dashed lines represent deaths. The map also shows the Passaic River flowing through the city.



# BOARD OF HEALTH.

— : 0 : —

F. B. MANDEVILLE, M. D., <i>President</i> ,	-	-	-	1021 Broad St
MOSES STRAUS, <i>Treasurer</i> ,	-	-	-	1085 Broad St
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C. M. ZEH, M. D.,	-	-	-	481 Broad St

- 0 -

## MEDICAL OFFICER OF HEALTH.

CHARLES LEHLBACH, JR., M. D.,	-	-	24 Breintnall Pl.
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# Standing Committees of the Board of Health,

FOR THE YEAR 1894.

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## On Finance,

Moses Straus,              R. B. Sutphen,              John B Stobaeus.

## On Sanitation,

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                                M. Straus,                      R. J. Marshall, M. D.

## On Laws and Ordinances,

William B. Guild,              C. M. Zeh, M. D.,              R. J. Marshall, M. D.

## On Appointments,

Robert B. Sutphen,              R. J. Marshall, M. D.,  
                                H. C. H. Herold, M. D.

## On Rules,

J. B. Stobaeus,              D. L. Wallace, M. D.,              J. A. Furman.

## On Supplies,

J. A. Furman,              D. L. Wallace, M. D.,              R. B. Sutphen.

## Committee on Newark City Hospital,

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                                J. A. Furman,                      J. B. Stobaeus

## Committee on Training School,

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                                D. L. Wallace, M. D.,                      C. Young, M. D.,  
                                C. D. Bennett, M. D.,              G. F. Underwood, M. D.

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HERBERT B. BALDWIN, <i>Chemist</i> ,	- - -	215 Market St
WILLIAM A. SMITH, <i>Apothecary</i> ,	- - -	75 Pennsylvania Ave
JOHN J. GREENE,, <i>Clerk</i> ,	- - -	- Warren St
JOHN H. McDONALD, <i>Typewriter</i> ,	- - -	158 Eighth Ave

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WERNER RUNGE, V. S.,	- - -	- 130 Union St
CHARLES WOLZ,	- - -	- 31 Ferry St

### Plumbing Inspectors,

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WILLIAM H. GRIER,	- - -	- 37½ Third St

### Milk Inspector,

WILLIAM H. LYLE.	- - -	- 63 Newton St
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### Sanitary Police,

\*Ball, John, 103 Johnson St  
Brady, A. J., 70 Arlington St.  
Edwards, R. J., 514 Central Ave  
Newton, T. F., 32 Clifton Ave.  
\*Studer, D., 24 Bowery St  
Seidl, M., 411 South 10th St  
Bellar, E. W., 45 Congress St  
Bridgem, L. H., 59 Court St.  
Knott, Samuel, 34 Colden St.  
Rawding, W., 40 Essex St.  
Young, William, 246 Norfolk St.  
\*Wright, John, Arlington St.  
\*Freeman, Thos. E., 15 Orchard St.

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\*Detailed to Disinfecting Corps.

## DISTRICT PHYSICIANS.

- 1st DIST —DR. L. A. HOFFMAN, No — Ferry Street. District Lines—Hamburg Place, Lafayette and Polk Streets, and Passaic River.
- 2d DIST —DR F. W. THUM, No. 149 Polk Street. District Lines—Hamburg Place, Lafayette and Polk Streets, Passaic River, Railroad Place, Ferry, Union and Pacific Streets, and Avenue D
- 3d DIST DR WM J SEIDLER Ferry Street District Lines—Broad, Market, Ferry, Union and Pacific Streets, and Avenue D
- 4th DIST DR F. CONNELLY, No. 14 Park Street District Lines—High Street and Central Avenue, Centre Street, Passaic River, Railroad Place, Market and Broad Streets, LaGrange Place, Washington and Spruce Streets.
- 5th DIST —DR EMANUEL ISLENBURG, cor Springfield Ave. and High Street District Lines—Hillside Avenue, Charlton Street, Springfield Ave., Rankin Street, Richmond Street, Bank, High, Spruce and Washington Streets, LaGrange Place and Broad Street
- 6th DIST DR F. WEBNER, No. 1 Belmont Avenue District Lines Fifteenth Avenue, Springfield Avenue, Charlton Street and Hillside Avenue
- 7th DIST DR V. NAGER, No. 23 Beacon Street. District Lines — Fifteenth Avenue, Springfield Avenue, Rankin, Richmond and Bank Streets, Wallace Place, Warren Street and Central Avenue.
- 8th DIST —DR E. E. WORL, No. 295; High Street District Lines—High, Orange and Norfolk Streets, Central Avenue, Hudson Street, Wallace Place and Bank Street
- 9th DIST DR E EVERITT, No. 587 Warren Street. District Lines Bloomfield and Clifton Avenues, Norfolk Street, Central Avenue, Hudson and Warren Streets and Central Avenue
- 10th DIST DR E ZEH HAWKES, No. 481 Broad Street. District Lines Centie Street, Park Place, Broad Street, Central Avenue, High and Orange Streets, Clifton and Bloomfield Avenues and Passaic River

ANNUAL REPORT  
OF THE  
Medical Officer of Health.



# ANNUAL REPORT OF THE Medical Officer of Health.

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NEWARK, N. J., December 31st, 1894.

*To the Board of Health of the City of Newark.*

GENTLEMEN.—Herewith is submitted to you a report of the Health Department for the year ending December 31, 1894.

It is with satisfaction that I am able to present to you the report of a period marked by an advance in sanitation in Newark, notwithstanding the fact that much time was devoted to combatting an outbreak of smallpox, which at its onset threatened to become epidemic.

A study of the facts presented, together with an analysis of the mortality records, show that the good effects of sanitation and the enforcement of the ordinances of the Board have had the effect of lowering the death rate of the city and of placing Newark foremost in the ranks of those cities which have become recognized as progressive in sanitary matters. Especially is the comparatively low death rate to be commented upon when it is considered that according to the United States Census of 1890

we have more people employed in many and varied industries, all of which are more or less non-conducive to health, than any other city of the same total population, in this respect being even on a par with cities having a population far exceeding ours.

Naturally the gross death rate in a manufacturing city is high, and when it is below what may be justly expected, and the causes of diminution are found in those diseases and deaths which are in a large measure controllable by the enforcement of sanitary laws, there is reason to be satisfied.

As you, Executive Officer, I have re-commended, where it seemed expedient, certain changes, and I trust that they will receive your consideration, and, if in conformity with your views, your endorsement.

#### VITAL STATISTICS.

##### BIRTHS.

The total number of births reported was 5,194. Of these 5,036 were white, and 98 colored, 2,621 were males, and 2,561 were females, and in 12 the sex was not stated. 5,138 were legitimate, and 56 illegitimate. The birth rate per thousand of the population is 25.47, and exceeds the death rate for the year. (See table I.)

##### MARRIAGES

There were recorded 1,630 marriages. This represents a rate of 7.94 per thousand, which must be considered below the actual rate. Neglect on the part of those whose duty it is to report these facts, is the cause. (See table II.)

##### DEATHS

There were recorded during the year 4,543 deaths, which represent a death rate of 22.28 per thousand of

the population. Of these 3,216 were native born and 1,309 foreign born, and in 18 cases the nativity was not stated. (See table III and table V, tabulated statement deaths.)

The social state of the deceedents was as follows:

Married .....	.....	.....	1,351
Single.....	.....	.....	2,569
Widow. ....	.....	.....	375
Widower ..	.....	.....	210
Not stated ..	.....	.....	38
<b>Total.</b>			<b>4,543</b>

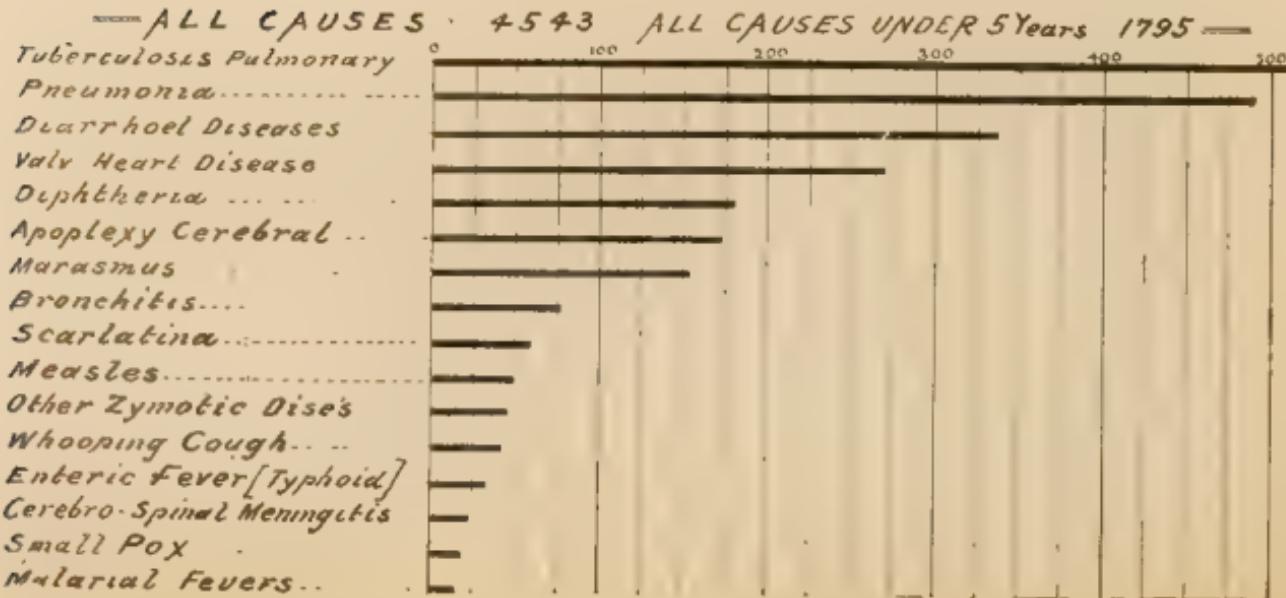
Six hundred and three deaths occurred in institutions. (See table III.)

The death rates for the various groups of ages per thousand of the population living at the same ages is as follows:

Ages.	Popu- lation	Mor- tality.	Rate per thousand.
0-1 year	5,490	1,164	212.02
0-5 years	26,247	1,795	68.39
5-10 years	22,780	204	8.96
10-20 years	38,980	232	5.95
20-30 years	42,628	364	8.54
30-40 years	31,818	418	13.14
40-50 years	18,953	401	21.16
50-60 years	11,536	357	30.95
60-70 years	6,974	376	53.92
70 and over	3,997	396	99.07
	<b>203,923</b>	<b>4,543</b>	<b>22.25</b>

*Some of the principal causes of death and those which are preventable are graphically shown in the following.*

DEATHS FROM PRINCIPAL CAUSES  
DURING THE YEAR 1894  
GRAPHICALLY SHOWN



**SOME OF THE CHIEF CAUSES.**

TUBERCULOSIS.—This widespread disease is due to infection by a specific germ, and individuals of low vitality are more prone to it than those who are in robust health. The many dust-producing industries in Newark are a cause of a large number of pulmonary diseases; hence sanitation should be directed to secure the most healthful conditions of workshops. In tuberculosis much can be done by destroying the infectious material cast off. In June of this year the Board of Health adopted a resolution requesting physicians to report cases of tuberculosis, especially those occurring in lodging-houses and hotels. A circular on "*Tuberculosis, Its Communicability and Prevention*," has been ordered published. Since January 1, 1894, all houses in which deaths from tuberculosis occur are disinfected. Although the result of these measures will not be noticeable at once, it is nevertheless certain that a diminution in the number of individuals infected is sure to follow.

PNEUMONIA.—The large number of cases of pneumonia, 488, is due mainly to climatic conditions. The sudden changes of humidity, temperature and pressure, to which the eastern sea coast cities are subjected, account largely for the prevalence of this disease. Another factor is the number of dust-producing industries in the city, and a third the dust arising from unpaved and uncleaned streets. Nothing renders the lungs more vulnerable than the inhalation of dust. Proper paving and keeping clean the streets of the city will tend to lessen the death rate from pulmonary diseases.

DIARRHŒAL DISEASES.—The number of deaths from

these diseases, 337, is small in comparison with other cities. Then lumber is largely dependent upon the milk and water supply. As the majority of those afflicted are infants and the cause of these diseases is usually some fermentative action, due to improper feeding, the careless preparation of the food, or to the use of improper feeding bottles, much good can be accomplished by the dissemination of facts relating to infant feeding and the preparation of infant food. A circular is now being prepared which clearly sets forth the proper methods to be pursued in infant feeding, and appended to it are notes on "*nursery hygiene*". It is intended to mail a copy of this circular to the address of each mother as soon as the birth of her child is recorded. In this way and with the aid of physicians and free clinics most will be reached. A decrease in the death rate from these diseases will follow.

**VALVULAR DISEASES OF THE HEART.** It has been authentically stated that heart diseases are increasing on the Atlantic sea coast. It is probable, as these diseases commonly have a rheumatic foundation, that the climatic conditions come largely into play and that the sudden temperature, humidity and pressure changes are in a large measure the cause, protection against these changes by proper clothing is necessary.

**ACUTE INFECTIOUS DISEASES.** These diseases are preventable and the deaths resulting therefrom are usually in direct proportion to the number of cases existing. Preventing the spread of these diseases will consequently lessen the number of deaths. More will be said of this in its proper place.

**COMPARATIVE STATISTICS.**

It is irrational to compare the death rate of cities for the purpose of ascertaining the effects of recent sanitation, unless the facts upon which the calculations are based, and the climatic and other conditions are alike. It would be f. i. absurd to compare the death rate of one city estimated on a population obtained by calculations based upon the United States Census, with the death rate of a city which estimates its population by multiplying the number of votes cast at an election by 5 or 7. In order that true comparisons be made, like must be compared with like.

At my request, Mr F W Hoffman, statistician, has prepared a statement in which he estimates the population of Newark to be 203,923, he has also analyzed the mortality returns, and compared them with those of other cities. In doing this the main point that all comparisons be made on a like and equal basis has been adhered to. (Mr Hoffman's statement is appended in full, because of its importance and value.)

On page 55 will be found comparative death rates for New York, Jersey City and Newark. It will be seen that the mean death rate for Newark and Jersey City, for the period from 1890 to 1894, is practically the same, the death rate of Newark for 1894 is somewhat lower than Jersey City, and is 147 per thousand of the population lower than that of New York. It will be noticed that in 1890 and in 1892 the death rate of Newark was excessively high, being 27.21 and 29.29 respectively. This was due to causes beyond sanitary control. During these years Grippe prevailed, and its ravages were naturally most marked, and it found a more fertile soil in that community in which, through occupation, a larger per-

centage of the inhabitants were rendered more susceptible to the disease than in those cities with which comparisons are made.

A reference to the United States Census of 1890 shows that there are employed in the three cities with which comparisons are made the following number of operatives, skilled and unskilled, New York, 227,342 Jersey City, 10,277; Newark, 30,000.

This represents per unit the following:—

New York, 1 in 83 individuals, Jersey City, 1 in 17.8 individuals; Newark, 1 in 6.7 individuals.

It is self evident that the proportionately larger number of individuals employed in manufacturing industries in Newark is the reason why the death rate will fluctuate at times above normal.

On page 56 will be found the population, mortality and death rate for various groups of ages per thousand living at the same age. A study of this table and the comparisons with other cities shows what proper sanitation is doing for Newark. In 1889 the total deaths under five years were 1,963, and in 1894 the total deaths under five years are 1,795, which is 168 less, notwithstanding the fact that the population since that time has increased over 20,000. *A rough test of the healthfulness of a locality, of its milk and food supply, and a fact of its general sanitary condition, is the total death rate under five years.*

On page 54 the comparative mortality under five years for six leading cities will be found. It will be seen that Newark leads the list and that its child mortality is lower than that of cities having a larger population.

The comparative death rate of Newark for 1894 and a mean of four other cities, two of which are Western inland cities and two Atlantic sea coast cities, are found

on page 57. The rate for Newark is lower with two exceptions, namely for the period of five to twenty years and the period of forty to sixty years.

One of the reasons why the rate between five to twenty in Newark is higher is that the rate is considerably swelled by the number of deaths from the acute infectious diseases between the period of five to ten. The rate from ten to twenty is very little higher than the corresponding rate for the other four cities. The marked excess in the rates between the ages of forty to sixty should not be passed unnoticed. Between these ages the most frequent causes of death are (see table V,

Apoplexy .....	54
Valvular Heart Disease .....	51
Chronic Nephritis .....	54
Acute Pneumonia .....	56
Total .....	275

This number alone is excessive; however, it is noticeable that these causes are such which are mainly determined by mode of life, occupation and climatic changes. When we take this into consideration, together with the facts already stated, that Newark is a manufacturing city of many and varied industries, the reason why the rate between forty and sixty years is higher becomes apparent.

The comparative death rate from five specified causes between Newark and New York is found on page 59, and on the same page comparisons are made between New York, Jersey City and Newark relative to typhoid fever. The lower rates in favor of Newark cannot be construed as accidental.

Our unpaved and unsewered sections; the often filthy streets, which are not systematically cleaned; the con-

dition of a large portion of our meadow land, sewage-laden; because of the defective condition of the wooden flume which carries the sewage from the pumping station to the Newark Bay; the miserable practice of a mixed collection of ashes and garbage and depositing them on the lowlands immediately adjacent to the built up portions of the city all these are factors which tend to make a city unhealthy and increase sickness and death.

The Board of Health has repeatedly called attention to these nuisances and recommended their abatement to those in authority. The ill effects which may accrue from the continued existence of these evils must be charged to them.

In concluding this brief statement of vital statistics I would call attention to tables IV and V, it is worthy of a close study, as it shows the actual mortality from some of the chief causes by districts representing the old wards. The approximate population for each ward is also given.

The fact that the Board of Health has access to the birth, marriage and death returns is owing to the courtesy of the City Clerk, the latter being the Registrar of Vital Statistics. This necessitates a double entry of all deaths, one in the office of the Board of Health for statistical purposes, the other in the books of the City Clerk as a matter of record. The vital statistics properly belong to Boards of Health, as the medical knowledge at command of Boards of Health is indispensable to the proper classification and recording of vital facts. Another and important reason is that it would bring the Board of Health in direct contact with and give it control over the undertakers in the city. This is of special importance in the disposition and burial of those dead from infectious diseases. I hope that these suggestions will be considered favorably by you and that steps be taken to secure the passage of a law which will make the Board of Health the *Registrar of Vital Facts*.

## INFECTIOUS DISEASES.

---

The following table shows the number of cases of diphtheria (including membranous croup), scarlatina, enteric fever and smallpox reported during the year by districts representing the old wards:

### INFECTIOUS DISEASES REPORTED

BY DISTRICTS REPRESENTING OLD WARDS.

WARDS.		Estimated Population	Diphtheria, including membr.'s croup.	Scarlatina.	Enteric Fever (ty- phoid).	Smallpox.
First	.	8,565	7	48	3	2
Second		7,953	15	39	3	2
Third		7,137	7	21	1	5
Fourth	.	6,729	11	46	10	34
Fifth		6,118	21	19	2	9
Sixth	.	28,957	83	211	12	4
Seventh		10,400	100	54	6	4
Eighth	.	22,024	28	103	9	2
Ninth	.	7,951	5	35	4	7
Tenth	.	15,498	23	81	5	15
Eleventh	.	13,255	24	108	0	2
Twelfth	.	22,024	19	100	60	22
Thirteenth	.	30,996	180	190	12	7
Fourteenth	.	6,322	8	49	5	15
Fifteenth	.	9,992	27	31	10	1
Total	.	203,923	466	1,145	89	131

**SMALLPOX.**

On the tenth of July, 1891, a case of smallpox was found in No. 53 River street. The disease was well advanced, being in the tenth to twelfth day. The patient, an Italian child eight months old, was immediately removed to the Isolation Hospital; the tenement-house, occupied by about twenty-five people, was quarantined, thorough disinfection practiced and all exposed individuals were vaccinated. Infection in this case was traced to New York, a relative of the child having visited Newark during his convalescence from varioloid.

The quarantined house was located in a block of tenements inhabited mainly by Italians. It was evident that the number of persons who had been exposed to infection was large, because of the long time which elapsed before the child came under medical observation and the disease was recognized. General vaccination of all the residents of the section was resorted to and accomplished under some difficulty, owing to fear on part of the people. On the twenty-first of July six further cases had developed in No. 53, and on the following day cases were found in adjoining houses. These cases were, however, in their incipiency and at once removed. Several other cases in the lower section of the city were also found and were traceable to River street. The continuance of the outbreak was due to concealed and unrecognized cases. There were brought to our attention during the outbreak at least four cases which were convalescent and which had been concealed through ignorance. To those cases a number of subsequent and scattered cases were traceable. Unrecognized cases were also responsible for a number of subsequent ones.

Vaccination often modifies the disease so that it is difficult to differentiate it from chicken pox and other eruptive skin diseases. Experience in smallpox goes to show that these mild unrecognized cases are more dangerous to the community than severe ones which are found in their incipiency, and it is for this reason that when dealing with these mild cases, in which a positive diagnosis cannot be made, it is better to give the community the benefit of the doubt and treat the case as if it were one of true smallpox by proper isolation and disinfection.

The total number of cases to January 1st, was 131 and by months were as follows:

July .. . . . .	26	October .. . . . .	13
August .. . . . .	42	November .. . . . .	9
September .. . . . .	28	December .. . . . .	13

The following table shows the number of those affected who were vaccinated and the result of the disease:

		Result.		
		Recovery.		Death
Vaccinated once.. . . . .	48	47		1
Vaccinated twice .. . . . .	1	1		
Vaccinated three times.. . . . .	9	9		
Second attack of smallpox .. . . . .	1	1		
Unvaccinated .. . . . .	72	55	17	
Total. . . . .	131	113	18	

In many of those who are recorded as unvaccinated an unsuccessful attempt had been made at different times during life, and most of them were vaccinated as soon as found.

From the beginning of the outbreak every case, as soon as diagnosed, was at once sent to the Isolation Hospital. Out of the 131 cases, only two exceptions had to be made, because removal would have endangered life.

Absolute quarantine was practiced during this out-

break, at its beginning there were at one time over 56 families quarantined, representing about 30 houses, which were guarded, and over 300 individuals. These had to be daily provided with food and inspected by physicians. Early in the outbreak it was found necessary to appoint two medical officers of quarantine, whose duty it was to visit daily all quarantined persons, attend to all outside vaccinations, and administer to the sick. Drs. Frank Connelly and E. E. Worl, who officiated in this capacity, deserve credit for the untiring zeal which they showed during these most trying times. Prior to the increase in the number of cases, and after their becoming less, this duty was performed by the District Physicians; they were always found ready and willing to comply with all orders that were issued, and invariably used tact and judgment in carrying them out.

The provisioning of this large number of quarantined persons was accomplished by establishing a commissary department in charge of two sanitary officers. A horse and wagon was provided, and all provisions were bought wholesale and delivered to the department store, which had been rented for that purpose. Every morning rations for each family were prepared and distributed. This system worked admirably, all being promptly supplied with eatables, and what is remarkable none but a few trivial complaints were made.

In all about 200 families consisting of about 900 individuals were quarantined during the outbreak. These had all been exposed to the disease, and it was due to prompt removal of the patients, thorough disinfection and vaccination that the disease was brought under control.

VACCINATION. The school children, public and private, of the city are well vaccinated. Especially in the public

schools is vaccination strictly enforced, and no child is allowed to attend school unless it has been successfully vaccinated, or has had smallpox. A child in whom vaccination has been unsuccessful can attend school only on condition that at certain intervals revaccination is submitted to.

During the year 24,930 individuals were vaccinated by the Health Department in the Newark City Dispensary. This, together with the vaccinations made by District Physicians, will probably bring the total number of vaccinations to about 28,000.

The expenses of the outbreak will be found in the financial report, they are, however, incomplete, as all bills contracted for in 1894 have not yet been presented.

#### HOSPITAL ACCOMMODATIONS.

The building which is used to isolate smallpox patients will accommodate about 30, and was soon filled. Two hospital tents, one of which would hold about 25, and the other about 12 patients, were erected during August. The floors of these tents were raised platforms, and to a height of five feet wooden walls were constructed. The canvass was spanned over this structure, which afforded comfortable quarters.

The building referred to above has no modern conveniences, is not properly drained, was originally intended and built for a "pest house for paupers," is untenable and weatherworn, cannot be repaired, and hence a disgrace to the city of Newark, and a proof that progress in Newark is slow.

On two different occasions the Board of Health has successfully fought smallpox under trying and unfavorable circumstances. To accomplish this, cases had to

be isolated in the building above mentioned to the disgust of the Board of Health, its officers, and those whom the law compelled to go there.

*We command, throughout its Board of Health, resolute that patients suffer from smallpox shall be isolated in a hospital, then it becomes the duty of that community to provide hospital accommodations and comforts equal to those which a patient would have at home, and not a "Pest House" of the type of bygone centuries.*

The Board of Health has repeatedly requested the Common Council to provide funds for the erection of proper hospitals for infectious diseases, and so long as the Common Council refuses to comply with the request of the Board in this respect, so long will any blame in the matter rest upon it, and not on the Board of Health.

A map showing the cases of smallpox topographically will be found appended to this report.

#### OTHER INFECTIOUS DISEASES.

**SCARLATINA AND DIPHTHERIA.** These are preventable diseases, the infection taking place from person to person either by direct contact or indirectly through infected articles, such as clothing, bedding, etc., etc. It is improbable that their origin, as was formerly and is yet believed by many, is ever to be found in imperfect drainage, putrescent matter, etc. In this respect they differ from those diseases which may properly be called ground diseases. To the latter class belong typhoid fever and cholera. Here the infection can be carried from man to the soil or water and through these others may in turn become infected.

In order to lessen the number of cases of scarlatina or diphteria or any other infectious disease in a com-

munity two things are primarily essential, namely, isolation and disinfection.

First, *the isolation of the patient*, i. e., placing the patient in surroundings which will make it impossible for him to infect others. If this cannot be done at home it becomes the duty of the community to provide suitable accommodations in the form of an *Infectious Disease Hospital*. Failure to provide such accommodations means the infection of many others, for isolation at home can rarely be accomplished and the deaths which result from these cases are the result of what, from an advanced view, must be looked upon as criminal negligence on the part of the community. Two hundred and forty nine children died of diphtheria and scarlet fever last year. If the same number were killed through agencies coming under the police control of a city the community would be up in arms and thousands of dollars would be willingly and justly appropriated to abate the cause. Why not the same public spirit in relation to infectious diseases?

Second, *the disinfection*. The patient having been isolated it becomes necessary to render harmless all infectious material coming from him. Thorough disinfection is as necessary as isolation.

In June the board, upon recommendation, authorized the Medical Officer of Health to organize a Disinfecting Corps; four men from the Sanitary Police Force were detailed to this work; they attend to all matters relating to infectious diseases and this work is more effectively performed than ever before. When the Disinfecting Station is completed nothing will remain to be done to secure prompt and effective disinfection in every case brought to notice. During 1894 this corps disinfected the following number of houses:

Houses in which deaths from tuberculosis had occurred .	515
Houses in which scarlatina had occurred .	1,145
Houses in which smallpox had occurred.... , .....	131
Houses in which diphtheria had occurred, .	466
Total number of houses disinfected .	2,257

In a general way it may be said that while the facilities for the eradication of infectious diseases have been the same during the year just passed as heretofore, still several important steps were taken which will soon give the Board a model Disinfecting Station, and it is hoped that proper hospital facilities will speedily follow. Twenty-four and a quarter acres of good land were purchased by the city for infectious disease purposes. The price paid was \$15,000. Upon this site the Disinfecting Station will be erected and it is proposed to add hospital buildings for scarlatina, diphtheria, smallpox and other infectious diseases which may need hospital care. The land is located on Grove street, Clinton Township, and is about 1,000 feet from the city line, besides being in the territorial centre of future Newark.



PROPERTY BELONGING TO THE  
CITY OF NEWARK  
CLINTON TOWNSHIP

Scale 800 ft to one Inch

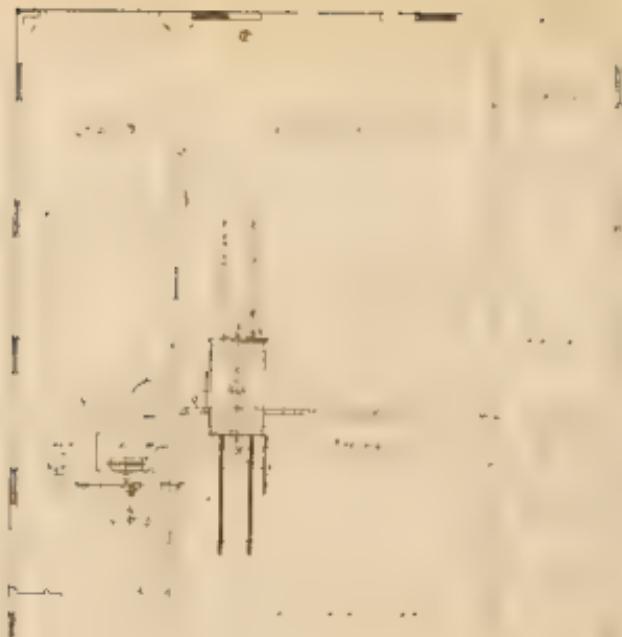
*The Disinfecting Station*, for which contracts have been awarded, was designed by Mr. Franklin Phillips and Mr. Edward Dunn, of this city, and the writer. The building containing the plant is 58 by 46 feet. There is no communication between the receiving-room for *infected* goods

and the discharging-room for *disinfected* goods, excepting through the sterilizer and the bathroom and dressing-rooms for the men handling the infected articles. On the infected side is to be a crematory designed for the incineration of worthless infected articles or to be used in case of epidemic. All floors are to be of chert stone and walls of hard plaster coated with waterproof porcelain paint. The sterilizer to be first used is an oblong steam jacketed retort 4 by 4 feet wide and eight feet long. It is so arranged that alternating currents of hot air and steam can be introduced, the latter under any desired pressure. Condensation in the sterilizer will be impossible and all disinfected articles will come out of the sterilizer perfectly dry. The plant is of sufficient capacity to supply the necessary steam, etc., for two additional sterilizers 6 by 6 feet wide and twelve feet long.

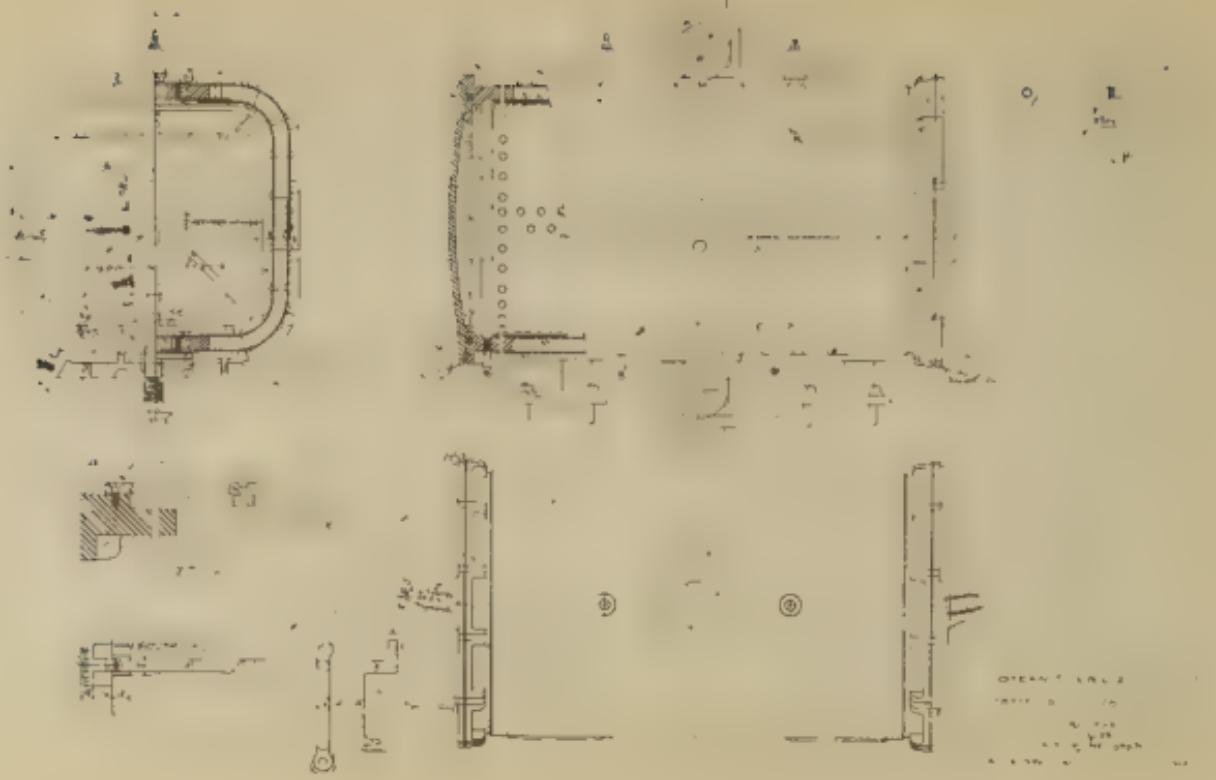
When, after a case of infectious disease, the premises are ready for disinfection, the method pursued will be the following:—

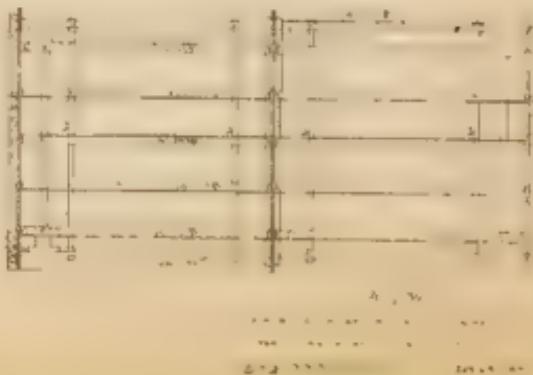
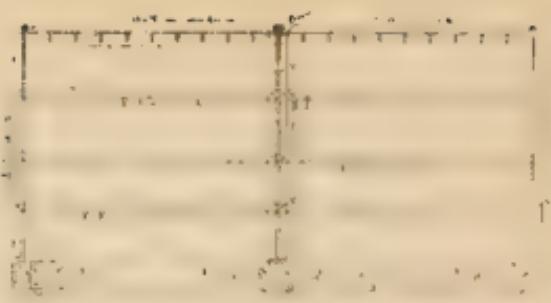
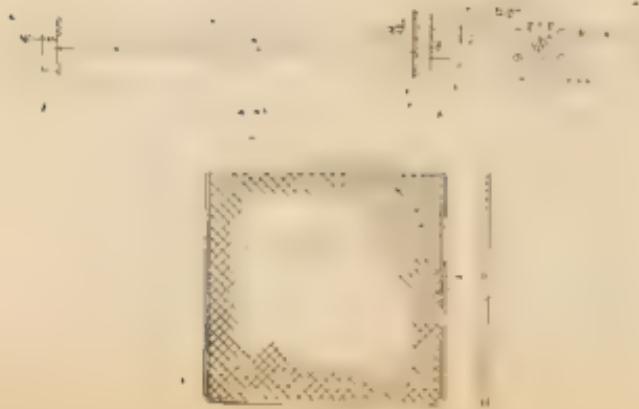
A wagon used for infected goods only will be sent to the premises. All infected articles, which cannot be rendered sterile by disinfecting solutions, will be put into large canvass sacks and taken to the station. (Such articles are mattresses, pillows, carpets, blankets, hangings, clothes, &c., &c.) It is estimated that articles can be taken from any point in the city to the station, there disinfected, and returned to the premises within six hours. While the articles are being disinfected at the station, a corps of men will wash or spray all surfaces in the infected apartments with disinfecting solutions. There are many other details of the disinfection of walls, &c., which cannot be given here, but the salient points in this method over the old fumigating system are that:

*That the disinfection is thorough, and that it will take only one-half the time which it takes to fumigate with sulphur. The latter method is of doubtful efficacy, and impractical on account of the irritating fumes created and the time required.*



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100







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The following is a description of the sterilizers by Mr. Franklin Phillips, Civil Engineer, who designed them:

"The apparatus consists of a steam jacketted sterilizing retort, provided with swinging doors at each end. A steam boiler to generate the necessary supply of steam, a fan blowing apparatus which forces fresh air over hot pipes, and a steam engine to drive the blowing apparatus, together with the necessary steam and air conveying pipes, are the essential features of the apparatus.

When infected goods are brought into the station they are placed on a metal car of light frame work, supported on portable tracks shown on drawing. The car is rolled into the sterilizer, the door is closed and tightly bolted, both valves connecting the interior of the sterilizer and the atmosphere are tightly closed, steam at a boiler pressure of 20 to 30 pounds is admitted to the interior; and after being subjected to a temperature due to this pressure for from ten to thirty minutes, the waste steam is blown off and the large valves opened to the atmosphere. The blowing apparatus is started, and heated air is then blown through the sterilizing chamber. After the materials have been thoroughly dried the door at the opposite end of the sterilizer is opened into a room free from infection of any kind.

To charge the apparatus again, it is necessary to return the car to the sterilizer, closing and securing the door behind it. The operation is then repeated."

A table is given of temperatures ranging from atmosphere to 40 pounds per square inch.

Total pressure per sq. in. above zero. a x ve zero Pounds.	Temperature in Fahrenheit degrees.	Total pressure per sq. in. above zero. Faint heat Pounds	Temperature in degrees
1	102.0	28	246.4
2	126.3	29	248.4
3	141.6	30	250.4
4	153.1	31	252.2
5	162.3	32	254.1
6	170.2	33	255.9
7	176.9	34	257.6
8	182.9	35	259.3
9	188.3	36	260.4
10	193.3	37	262.6
11	197.8	38	264.2
12	202.0	39	265.8
13	205.9	40	267.3
14	209.6	41	268.7
14 7	212.0 .atmospheric pressure.	42	270.2
15	213.1	43	271.0
16	216.3	44	273.0
17	219.6	45	274.4
18	222.4	46	275.8
19	225.3	47	277.1
20	228.0	48	278.4
21	230.6	49	279.7
22	233.1	50	281.0
23	235.5	51	282.3
24	237.8	52	283.5
25	240.1	53	284.7
26	242.3	54	285.9
27	244.4	55	287.1

#### BACTERIOLOGICAL LABORATORY.

In diphtheria scientific research has shown that many of the cases of membranous inflammation of the throat and larynx are not cases of true diphtheria. These cases of pseudo diphtheria have a low mortality, while in true diphtheria the death rate is high; both are, however,



M A P  
OR  
THE CITY OF  
**N E W A R K**  
STATE OF  
*NEW JERSEY*

### Diphtheria and Smallpox



exceedingly infectious and isolation and disinfection should be practiced in one as well as in the other.

It is often impossible to differentiate clinically between true and false diphtheria. Recent advances in the treatment of diphtheria make an early diagnosis of the disease imperative. This can be done only by bacteriological examination. In my monthly report to the Board for November, 1894, and on several previous occasions, the establishment of a bacteriological laboratory is recommended. The equipping of such a laboratory is not very expensive; a competent bacteriologist will have to be placed in charge. In the light of modern sanitation a bacteriological department is a necessary and indispensable adjunct to a properly equipped Board of Health. It is not alone in diphtheria that bacteriological examinations are of value, but also for diagnosis in suspected cases of tuberculosis, typhoid fever and cholera. In the detection of infectious diseases in animals, often the culture tube and microscope alone will reveal the truth. Of equal importance is the bacteriological examination of water and food. Newark should be one of the first communities to establish such a laboratory, and keep abreast with the advancements made in the field of preventive medicine.

#### **WHOOPING COUGH, MEASLES AND CHICKEN POX.**

These three diseases are not reportable in this city. The first two are often fatal. The deaths from measles during 1894 were 49 in number, and from whooping cough 44 died. While it would not be expected that the Board of Health take the same stringent measures in these diseases as in diphtheria, scarlatina and smallpox, nevertheless if, by ordinance, physicians were compelled

Privies, (open surface), 200 feet from stream...	7
" (open surface), 250 feet from stream .. . . .	3
Total	42

**PRIVY VAULTS FOUND** -These mainly very shallow and not water tight may at any time become sources of direct contamination :—

About 50 feet from stream	3
About 75 feet from stream .. . . .	3
About 100 feet from stream .. . . .	2
About 200 feet from stream .. . . .	3
About 250 feet from stream .. . . .	2
Total .. . . .	13
Number of vaults found within 150 feet, but exact distance not determined	10
Cesspoo., with water closet connections, 150 feet from stream.	1

The above gives a total of 66 direct and indirect sources of contamination. Of these, those 100 feet or less from the border of the stream are deemed as directly contaminating. They number 26 (including those built over stream and those draining into water by means of sewer—five in all).

#### SECOND—BARNs.

Within 5 feet.	1
Within 15 feet	2
Within 25 feet	2
Between 25 and 50 feet	2
Between 50 and 100 feet.	2
Over 100 feet	6
Total	16

Those given are such from which contamination takes place.

#### THIRD—PIG STYES.

Within 10 feet.	4
Within 25 feet	6
About 50 feet	1
About 100 feet and over.	4
Total	15

From the above it will be seen that in all were found about 97 actual and possible sources of animal contamination.

Among the barns found there were a few in very close proximity to the water edge and the drainage from these was directly into the stream.

From the foregoing it will be seen that the main reason why animal contamination is slight is because habitation in the area drained by the Pequannock River and its tributaries is so very small. In fact there is perhaps no other region in New Jersey covering the same number of inhabitable square miles in which so few people live. But the majority drain directly or indirectly into streams from which Newark draws its water supply.

It is self-evident that, although the existing contamination is very small, measures should at once be adopted which will insure absolute purity of the water and exclude any possibility of infection from epidemic diseases. Under the present conditions should typhoid fever or cholera occur in the Pequannock region the germs of these diseases might readily find their way into the water and would in consequence prove a source of great danger to this community. Of as great importance as is the removal of existing nuisances is the prevention of those which may occur hereafter. This region is open to increased settlement, and hand in hand with it will come increased pollution unless steps are taken to prevent it.

Already Cedar Pond, which is one of the sources from which Clinton reservoir draws its water, has been bought by a Passaic Company. They own about 2,500 acres and intend to establish summer residences there. This may happen in other sections of the drainage area f. i. Hanks Pond and Echo Lake or around the reservoirs.

Personally the writer believes that the only way in which a water supply of the size of the one on which Newark depends can be kept permanently free from pollution is by either the State or the municipality owning sufficient land adjacent to the reservoirs and all the streams and tributaries to insure forever non-contamination. In other words, to exclude habitation. Sanitary regulations may answer for a time in thinly populated sections, but as human habitation increases these are no longer sufficient, for with increased population comes increased filth, and the latter must reach at some time in any given section what may be called a point of saturation, and when that point is reached the surplus will find its way by natural means into the general drainage system of that section. Watersheds should be free from human habitation and its accompanying filth, and in order to accomplish this, State or municipal ownership of water sheds is essential.

Until such steps are taken what can be done to abate existing nuisances and prevent the establishing of new ones? The answer is as follows. The enforcement of the present laws, especially the law of 1893, Chapter 157, which makes it a misdemeanor to contaminate in any manner the water of any creek, stream, etc., used for drinking purposes. It may be added that it is clearly the duty of the Board of Street and Water Commissioners to take active steps by prosecuting those who are at present dumping filth of any kind directly or indirectly to find its way into the streams or their tributaries in the Pequannock watershed.

It should be mandatory that no privies or manure pits be maintained within a distance of at least 200 feet of freshets, and these should be constructed absolutely

water tight and in such a way that the contents can be easily removed and disinfected. Cesspools should be built at least the same distance from the water, and in no case should water closet connection be allowed with them. The use of the earth closet system should be allowed, providing the disposition of the contents is satisfactory to some competent authority.

At several points in the watershed the main pipe of the Standard Oil Company was found exposed and unprotected. It was found crossing the Echo Lake brook, about 300 feet from Clinton reservoir, and several large rocks were resting upon it. So far as can be ascertained no large leaks have occurred in the last few years, but should the pipe break at this point, or at several others noticed, the escaping oil would find its way directly into the water, and if in sufficient quantity would render it unpotable for a time. Where the pipe is found unprotected near streams the Standard Oil Company should be compelled to take all possible precautions to prevent leaks from occurring. All rocks resting on the pipe or in danger of falling upon it should be removed and iron guards should be built around the pipe for protection. Frequent inspections of the line should be made.

#### WELLS.

A systematic examination of well water was commenced in June, 1892. A diagram of the premises and surroundings was made in each case, showing the location of the well and the number of contaminating sources within a given radius (see table VI). Up to January 1, 1895, 462 wells had been recorded and the result of the analyses is graphically shown in the following, representing 425 wells analyzed:

---

*Contaminated, 57  $\frac{1}{100}$  per cent.*

---

*Suspicious, 27  $\frac{3}{100}$  per cent.*

---

*Passable, 15  $\frac{5}{100}$  per cent.*

---

A glance will convince the most skeptical that the "pure and sparkling" well water is usually poor and polluted. It was found that in 63 instances typhoid fever had occurred on the premises on which wells were found. The wells that were found contaminated were ordered closed by the Board of Health, and in all cases where the city's water supply was available this was done. Where the people, however, were dependent upon well water, there being no water man in the street, they were advised to boil the water before using it. In most cases mains were promptly laid by the Water Department where chemical analysis showed the wells unfit for domestic use.

In the appendix will be found two tables, one showing alphabetically every well which has been recorded, together with such facts as were deemed essential to a proper understanding of its surroundings. The other table is that of the chemist, and gives the analysis of each well. The "sample number" is the same in each, and will afford an opportunity for comparison.

*The work which has been done in this line has now reached a point where we can safely say that the wells of our city are contaminated to such an extent that their continuance is a startling menace to the public health. With one of the best water supplies in the world, and a Water Department which would willingly extend the mains to any necessary point, it seems almost criminal to allow the existence of surface wells.*

*It is recommended to your Board that an ordinance be passed prohibiting the further maintenance or construction of*

*surface or dug wells in the City of Newark. And, further, that no driven or bored wells be constructed or maintained without permission of the Board of Health, and then only where the water is intended for manufacturing purposes.*

#### CHEMICAL ANALYSES, MILK AND FOOD INSPECTION.

The Department has had the valuable assistance of a regularly appointed chemist under a fixed salary. The report of the chemist will be found on page 65, and is very instructive. Besides the many water analyses, milk and food analyses have also been made. The city water has been analyzed at regular intervals.

MILK Upon this important article of food depends the health of the infant population of the city. The Board has one Milk Inspector, who examines the milk on wagons and in stores with a lactometer. This test is unsatisfactory because it shows only whether the milk has been watered or not; it does not determine its quality.

The work performed by the Milk Inspector was as follows:

Number of wagons halted..... . . . . .	1,462
" cans of milk inspected .. . . . .	2,703
" lactometer tests..... . . . . .	1,240
Number stores visited .... . . . . .	1,609
" cans milk inspected .. . . . .	1,630
" lactometer tests..... . . . . .	1,170
Samples found suspicious and delivered to the chemist . .	24

It does not seem that the small number of suspicious samples found warrants the continuance of the present system. We should strive to obtain our milk from cows which are properly housed and fed and which are free from any suspicion of disease. To this end I would

recommend that all dealers in milk, resident or non-resident, be licensed by the Board. The license could properly be fixed at \$2.00 and the Board should reserve the right to revoke the same. This would give the Board absolute control of dairies located out of town, and when it is known that unsanitary conditions are maintained in any particular dairy the sale of milk from that dairy could be prohibited by revoking the dealer's license.

As to local inspection, I would suggest that instead of one Milk Inspector the whole Sanitary Police Force be at such times as may be thought proper detailed to take as many samples as possible and deliver them sealed to the chemist. This would probably result in an examination of double the quantity of milk now examined and would have the advantage of having all the samples tested by the chemist, who is a competent person to do so.

*Food Analyses* have not been systematically pursued, as the chemist's time was mainly devoted to water analysis. The latter being practically finished, it is intended to commence a systematic investigation of foods and perhaps drugs during the ensuing year.

#### COW STABLES.

A thorough inspection of the cow stables in the city has been made and unsanitary conditions corrected as far as possible. The stables referred to are those where milk is produced for sale.

Table VIII, in the appendix, contains the list and the result of the inspections.

It will be observed that the questions asked are such as will give the reader a mental picture of the condition of the stable.

While the general condition is fair, yet it is hardly to

be presumed that cows which are kept in close quarters and do not have good pasturage and room for exercise will give wholesome milk. While no complaints are made against these stables, many of them are nevertheless a nuisance. I would recommend that some steps be taken to bring about the gradual abolition of cow stables in Newark. This can probably be best done by passing an ordinance fixing certain limits where stables can be maintained similar to the fire limits for frame dwellings and prescribing the distance which a cow stable should be from surrounding dwelling-houses, and further, not allowing the maintenance of a stable unless there is sufficient room adjacent thereto for pasturage and exercise.

*Three hundred and eighteen animal permits* cows, goats and swine were issued during the year and the number of animals licensed through these was 1,304.

## PLUMBING DEPARTMENT.

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This department is now perfected, and the work done by the two inspectors is very creditable. A uniform system of filing plans has been adopted, and the index by streets and the filing system are so arranged that in future years the plumbing plans of any house, together with the specifications, can be found at once, no matter when the plan was filed. These plans will be of considerable value in years from now, as they show the location of all pipes and fixtures.

The following is a summary of the work done in the Plumbing Department during the year:—

Permits issued to construct plumbing systems	955
Number of plans and specifications filed	1031
Plans rejected	44
Water tests, number of	1258
Number of peppermint tests . . . . .	112
"    plumbing inspections	1587
"    final plumbing inspections	1042
"    permits for McClelan vents	379
"    special plumbing inspections.	203
"    violations, notices issued . . . . .	19
"    schools, private and public, inspected	71

## MEAT AND LIVE STOCK DEPARTMENT.

This department is in charge of two inspectors, one a veterinarian, who looks after the slaughter-houses and wholesale meat depots, and the other an experienced butcher who visits all the public and private meat and vegetable markets. Good work has been done by them. This department costs a little over \$2,000 yearly. I believe that by licensing all the butchers, wholesalers and retailers and the slaughter-houses, this department could be made self-sustaining and recommend that this be done. The following is a summary of the inspections in this department and the condemnations during the year.

### SLAUGHTER-HOUSE INSPECTION.

Number of cattle inspected . . . . .	11,709
"    calves inspected. . . . .	14,793
"    sheep and lambs inspected	10,058
"    swine inspected	4030

### CONDEMNED.

Number of cattle	25
"    calves . . . . .	47
"    horses (on account of Glanders) . . . . .	8
"    mules " " " . . . . .	1

### INSPECTION OF BUTCHER SHOPS AND CONDEMNATIONS.

Number visited.....	11,570
" carcasses beef inspected.....	33,645
" lambs and sheep inspected .....	108,075
" calves inspected .....	28,760
" swine inspected .....	12,850
INJEMNEL	
Bob veal, carcasses.....	44
" " pounds .....	283
" " quarters .....	52
Beef, loin .....	4
" pounds .....	1,790
Lamb, carcasses .....	25
Chicken, pounds .....	667
Fish, pounds .....	570
Mutton, carcasses .....	1
Beet, quarters .....	5
Pork, pounds .....	36
Corned beef, pounds .....	200
Turkey, pounds .....	758
Capon, pounds .....	140
Geese, pounds .....	136
Smoked Hams .....	52
Ducks, pounds .....	70
Veal, pounds .....	270
" quarters .....	2
Mutton, pounds .....	39
Calves .....	29
Two boxes of chickens, $1\frac{1}{2}$ barrels of peas, 1 barrel of veal, 1 barrel of chickens, $\frac{1}{2}$ barrel of turkeys, $1\frac{1}{2}$ barrels of ducks, 4 crates eggs, 1 wagon load vegetables, 1 wagon load fruit, 1 barrel of geese.	

### SANITARY INSPECTIONS.

In this department, under the supervision of Superintendent David D. Chandler, the following work was accomplished during the year:—

Number of citizens' complaints.....	1,710
" " " " verified .....	1,298
" " " " no cause found .....	412

Number of written notices served	2,862
" nuisances abated	3,022
" cases of defective drainage abated	1,282
" original inspections	11,295
" verba. notices given, ..	1,188
" abatements, nuisances, . . .	1,572
" abatements, defective drainage	171
" hours spent in court by inspectors	173
" permits issued for cleaning Privy Vaults	1,295
" permits issued " " Cess Pools	125
" sewer drains inspected	83

The strict enforcement of the ordinances of the Board has done much to improve the sanitary condition of the city. Hundreds have been compelled to abandon cess-pools and sewer-connected premises. The plumbing in dwellings has been carefully checked after, and changes ordered when found defective—such filling in of sunken and marsh lands was accomplished. Lodging houses have been frequently inspected and a complete census taken, and unsanitary conditions rectified. Citizens' complaints have been promptly and impartially investigated.

A word should be said relative to the cleanliness of streets and sidewalks and to the manner in which citizens set out garbage for collection by the scavenger. In this respect Newark is far behind other cities, because the Board of Health and other city departments have not had that co-operation of the Police Department which they should have. There are cities where the individual police officer is made responsible for the sanitary condition of his beat only, however, as far as sidewalks and streets are concerned. The vigorous enforcement of such a policy here would soon give us a clean city. Broken and overflowing garbage receptacles, gutters filled with rubbish and paper, making unsightly our principal thoroughfares all these would soon disappear. Those who

are not acquainted with Newark's sanitary condition are apt to judge it by the condition of its streets and highways; that their impression is a poor one naturally follows.

## THE NEWARK CITY DISPENSARY AND THE OUTDOOR POOR DEPARTMENT.

This department is under control of the Board of Health, and is maintained out of its appropriation. The total cost of maintaining it was for 1894 \$8,922.53; a detailed statement of the expenses will be found in the financial report for the year. This large amount of moneys comes out of the Board's general appropriation, and in calculating the expenses of the Board for sanitary purposes should not be included.

### SUMMARY OF REPORT OF CITY APOTHECARY.

Number of new cases treated at City Dispensary .....	5,345
"      vaccinations. ....	24,930
"      prescriptions by clinic. ....	23,136

### Number of prescriptions prescribed by District Physicians —

First district... . . . .	843
Second district. . . . .	895
Third district. . . . .	1,710
Fourth district. . . . .	1,113
Fifth district. . . . .	1,277
Sixth district. . . . .	826
Seventh district. . . . .	652
Eighth district. . . . .	873
Ninth district. . . . .	703
Tenth district. . . . .	808
	9,700
Total number of prescriptions.....	32,836

## SUMMARY OF SERVICES RENDERED BY THE DISTRICT PHYSICIANS.

	Cases.	Visits.	Sent to Hosp	Deaths.
First district. ....	346	616	15	19
Second district . . .	836	1,258	67	36
Third district ....	526	1,266	46	17
Fourth district.....	427	618	52	8
Fifth district . . . .	699	1,885	42	16
Sixth district .... .	581	1,315	25	19
Seventh district . . .	361	665	21	11
Eighth district . . .	571	902	43	13
Ninth district ..... .	402	599	19	13
Tenth district. . . .	543	1,012	27	14
	5,292	9,636	357	166

The total amount spent for drugs was \$2,397.27, making the average cost of each prescription seven and three-tenths cents.

A detailed financial statement of the money expended by the Board of Health for the year ending December, 1894, is appended.

The meteorological reports of Professor George C. Sonn are given in detail in table IX., together with a summary for the year.

In conclusion, I desire to thank the Board of Health and its members individually for the confidence which they have reposed in me, and beg leave, also, to express my thanks to all the officers of the executive department of this Board for the cheerfulness and alacrity with which they have performed their arduous and often not very pleasant duties.

CHARLES LEHLBACH,  
*Medical Officer of Health.*

## MORTALITY STATISTICS.

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Analysis by F. L. Hoffman.

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*Dr. Charles Leibbach, Medical Officer of Health, Newark,  
N. J.*

MY DEAR SIR:—In your favor of recent date you ask me to make a brief analysis of the Newark mortality returns for the year 1894, and at the same time give my opinion in regard to the probable population and consequent death rate of the city for 1894.

A brief discussion is difficult, since so many points need a lengthy explanation to enable those not familiar with statistical method and statistical fallacies to properly judge of the value of the conclusions arrived at.

The question of population alone is deserving of a detailed discussion to set at rest the many erroneous views that so generally prevail, even among the otherwise well informed, in regard to the method by which a fairly accurate estimate of the population for intercensal years can be arrived at. The only scientific and fairly reliable method is that known as the Registrar-General's, on the principle of the geometrical increase of the population of communities of normal growth. This method is in use in all the foremost statistical offices of the world and is in this country employed by the Massachusetts State Board of Health, Dr. Billings, expert special agent of the census, etc. I am fully aware that there are many who will not accept the census of

1890 as accurate and trustworthy, but after a careful analysis of the elements of the population of fifteen leading cities I feel entirely safe in asserting that the Eleventh census is as trustworthy as any of the ten that have preceded the same. To adopt an arbitrary method for this purpose is simply making matters worse and to calculate the population on the basis of assessed polls, the number of houses built, the number of votes cast in the last election or the number of names in the city directory is nothing but the merest guess work.

In accordance with the geometrical method the following estimates of the population of Newark, Jersey City and New York City have been calculated, and if the corresponding death rates are not as favorable as they would be if a higher estimate of the population of the city were accepted as a basis, it is always better in this matter to understate than to overstate the death rate of a city. To over estimate a death rate on a fictitious population is nothing less than an attempt to delude citizens into a sense of security in regard to their health and well being and in consequence an inducement to relax in vigilance over matters which are the most important elements of the welfare of a city.

The four tables which follow show the population, mortality and death rates of Newark, Jersey City and New York for the period 1890-1894, as well as the mean death rate for the five-year period:—

POPULATION, MORTALITY AND DEATH RATE FOR NEWARK,  
JERSEY CITY AND NEW YORK, 1890-1894

NEWARK, N. J.

	Popula- tion	Mor- tality.*	Rate per 1,000.
1890	181,830	4,948	27.21
1891	187,118	4,420	23.62
1892	192,560	5,641	29.29
1893	198,160	4,900	24.73
1894	203,923	4,760	23.34
1890-94			25.60

\*For fiscal year ending June 30.

JERSEY CITY, N. J.

	Popula- tion	Mor- tality*	Rate per 1,000.
1890	163,129	4,253	26.10
1891	168,102	4,386	26.09
1892	173,226	4,633	26.75
1893	178,506	4,541	25.44
1894	183,947	4,320	23.48
1890-94			25.54

\*Fiscal year ending June 30.

NEW YORK CITY, N. Y.

	Popula- tion	Mor- tality	Rate per 1,000.
1890	1,515,301	40,103	26.47
1891	1,550,255	43,659	28.17
1892	1,585,925	44,329	27.95
1893	1,622,508	44,486	27.42
1894	1,659,937	41,175	24.81
1890-94			26.94

COMPARATIVE DEATH RATES, 1890-94.

	Newark.	Jersey City.	New York.
1890	27.21	26.10	26.47
1891	23.62	26.09	28.17
1892	29.29	26.75	27.95
1893	24.73	25.44	27.42
1894	23.34	23.48	24.81
1890-94	25.60	25.54	26.94

The mean death rate of Newark for the period 1890-94 is almost identical with the rate for Jersey City, and 1.5 per 1,000 below the rate for New York. According to Dr Billings the mean rate for New York for 1885-90 was 27.66 and for Brooklyn 24.17. Much to my regret, it is not possible for me to give a rate for Newark for that period. For 1894, it will be observed, Newark had the lowest rate of the three cities compared in the preceding tables. A comparison of mere gross death rates, however, is not a reliable method, since the differences in the age distribution of the population of the different cities seriously affect the general death rates. This element of error is overcome by calculating the mortality on the number of persons living at specific groups of ages. This has been done in the next table, in which the death rates are given for ten different groups of ages. In part this table is estimated, since the detailed information in regard to the age distribution of the population in 1890 has not as yet been made public.

POPULATION MORTALITY AND DEATH RATES FOR VARIOUS GROUPS OF AGES

(Per 1,000 living at same ages.)

Ages	Popula- tion.	Mor- tality.	Rate per 1,000
0-1	5,490	1,164	212.02
0-5	26,247	1,795	68.3
5-10	22,780	204	8.96
10-20	38,980	232	5.95
20-30	42,628	364	8.54
30-40	31,818	418	13.14
40-50	18,953	401	21.16
50-60	11,536	357	30.95
60-70	6,974	376	53.92
70 and over	3,997	396	99.07
Total	203,923	4,543*	22.28

\*For the calendar year ending December 31, 1894.

COMPARATIVE MORTALITY UNDER FIVE YEARS FOR SIX  
LEADING CITIES.

	Popu- lation *	Mor- tality.	Rate per 1,000
Newark, 1894. ....	26,247	1,804	68.39
Jersey City, 1894 . . .	23,676	1,900	80.25
New York,† 1885-90 . . .			109.48
Brooklyn,† 1885-90. ....			93.42
Boston,† 1885-90 . . .			94.42
Philadelphia † 1885-90 ..			82.83

\*Estimated    †Reports of Dr. Billings

The method here employed has the advantage over a gross death rate, in that the effect of local climatic or sanitary conditions can be traced for each group of ages, which is of the greatest importance to the student of climatology and vital statistics. It will be observed that the child mortality in Newark is considerably below the child mortality of Jersey City and other cities with a much larger population. Newark in 1894 had only 1,793 deaths under five years to the 1,900 of Jersey City. The death rate under 5 is justly considered an almost infallible index of the sanitary condition of a community, and the result here shown is deserving of consideration. To make the most extended use of this table possible I have compiled from advance data of the Eleventh census a table of corresponding death rates for four cities for the year 1890, which will serve as a means of comparison of the Newark mortality at different groups of ages with the average mortality of other communities.

COMPARATIVE DEATH RATE OF NEWARK, 1894 AND FOUR  
CITIES, 1890.

Age Period.	Newark.	Four Cities.*
0-1. .... . . . .	212.02	230.92
0-5 . . . . .	68.39	72.74

\*Boston, Cincinnati, St. Louis and New Haven, Conn.

Age Period	Newark.	Four Cities *
0-5	8.96	7.50
1-5	5.95	5.45
20	8.54	9.37
< 40	13.14	13.60
40-50	21.10	19.49
50-60	30.95	26.57
60-70	53.92	56.88

\* Boston, Cincinnati, St. Louis and New Haven, Conn.

According to this table there are distinct differences in the mortality rates of Newark and the combined mortality of four other cities used here as a standard of comparison. The Newark death rates are favorable for the age periods 0-5, 20-40 and 60-70, but unfavorable for the periods 5-20 and 40-60. Considering the large industrial population of Newark, the vast majority of which fall under this age group, it is remarkable that the mortality should be so favorable. A more extensive investigation would be necessary to disclose the causes of the higher mortality for Newark at the two periods for which the city rate is in excess of the combined mortality.

The death rates under one and under five years are exceptionally favorable and much below the rates for other cities and localities. For 1893 the rate for Boston, Mass., was 280 per 1000, for Providence, R. I., 272, for Eastern Massachusetts, 244, for Western Massachusetts, 237, for New York city 1890, 279, for Brooklyn 1890, 255 per 1000 of population under one year of age against a Newark rate of only 212 per 1000.

All of these rates are considerably in excess of the Newark rate, until this rate can be maintained, or, better still, be still further reduced, the general health of the city will be correspondingly favorable.

In regard to the prevalence of certain diseases, it is not possible at present to make a satisfactory comparison with the returns for other cities for 1894. The complete returns will not be available for some time to come, and I can make use of only a very few comparative statistics compiled from monthly reports. In the table below the death rates for five selected causes are given for Newark and New York, and for typhoid fever for Newark and Jersey City.

COMPARATIVE DEATH RATES FROM FIVE SPECIFIED  
CAUSES, 1894.

	Newark.		New York.	
	Actual death.	Per 100,000 of popula'n.	Actual death.	Per 100,000 of popula'n.
Consumption .....	515	252.55	4,687	282.36
Diphtheria .....	180	88.37	2,371	142.77
Typhoid fever. ....	34	16.67	325	19.58
Smallpox .....	18	8.83	156	9.39
Diarrhoeal dis .....	337	165.25	3,043	183.32

The specific death rates shown in this table are without exception favorable to Newark in comparison with New York city. The low rates for typhoid fever and diphtheria are especially deserving of consideration.

The mortality from typhoid fever is considered strictly preventable and that of diphtheria largely so and the position of Newark in this respect, especially in comparison with Jersey City, is exceptionally favorable. The table below shows the actual mortality from typhoid fever for Newark, Jersey City and New York, for the year 1894 as well as the corresponding death rates per 100,000 of population.

COMPARATIVE MORTALITY FROM TYPHOID FEVER, 1894

	Deaths	Per 100,000
Newark .....	34	16.67
Jersey City. ....	119	64.69
New York .....	325	19.58

I regret that it has not been possible for me to make a more extended investigation of the vital statistics of the city. A study of the abundant statistical material would no doubt bring forward many interesting and valuable facts in regard to the sanitary condition of the city, as well as in regard to the effect of local sanitary measures. The result of this investigation would seem to prove that the general Health of the city is good, the mortality for specified groups of ages and for certain selected causes below the average, and finally that there has been an improvement in the death rate during recent years.

Sincerely yours,

FREDERICK L. HOFFMAN.

## FINANCIAL REPORT.

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Detailed statement of money expended by the Board of Health for the year ending December 31, 1894:—

### SANITARY DEPARTMENT.

Medical Officer of Health, salary...	\$2,500 00
Superintendent of Sanitary Department, salary	1,500 00
Attorney (four months and seven days), salary.	388 06
Chemist, salary, . . . . .	750 00
Clerk, salary . . . . .	1,000 00
Typewriter, salary . . . . .	399 30
Meat inspectors (2). (These inspectors furnish their own conveyances) . . . . .	2,000 00
Plumbing inspectors (2)	2,000 00
Milk inspector	782 50
Sanitary police (16)	12,126 25
Janitress . . . . .	180 00
Office rent	799 92
Amount paid physicians for reporting infectious diseases	441 00
Petty cash	200 00
Printing and stationery	809 99
Rent of telephones	30 00
Light for office . . . . .	89 85
Coal	23 55
Repairing office furniture	9 25
Incandescent lamps	16 04
Disinfectants	63 64
Typewriter supplies	2 35
Advertising . . . . .	3 50
Carpenter work in office	41 20
Paint. . . . .	4 30
William Whalen (constable fees . . . . .	6 47
Removing telephone, etc... . . . . .	10 75

American Public Health Association . . . . .	\$5 00
One year's subscription for Annals of Hygiene.	2 00
One City Directory	5 00
Professor George C. Sonn, meteorological reports	25 00
Electric light shades	, 00
Engineering Record, one year's subscription	5 00
Stoves and fixtures for office	43 10
Ice for office	10 50
Insurance, office furniture. . . . .	31 00
Kohn case judgment against Meat Inspector Wolz)	15 13
Expenses to Philadelphia, Pa., inspection of hospitals and disinfecting station	
. . . . .	70 00
Expenses to the meeting of American Public Health Association	50 00
Plumbing work at No 78 William street, by order of Board of Health	234 00
Drilling milk sample bottles. . . . .	1 20
Transcript of testimony Kohn case (ordered by the court) . . . . .	41 90
Expressage	2 75
Cabinet (Tucker File Company)	31 00
Washing towels for office	6 30
One flash gas stove.	1 00
Telegrams	1 32
	<u>\$26,931 42</u>

## DISPENSARY.

Apothecary's salary . . . . .	\$1,200 00
Apothecary's assistant salary part of year or 3 . . . . .	325 00
Janitress, salary . . . . .	150 00
District physicians' salary (10). . . . .	1,000 00
Drugs . . . . .	2 37 29
Delivery salary	150 00
. . . . .	229 95
Gaslight	12 49
Ice. . . . .	44 20
New Jeasey Purifying Co. (rent of filter)	9 00
Surgical instruments.	64 47
Printing and stationery and new books	126 00
Plumbing work.	27 23
Coal . . . . .	48 00
Cabinet and bandages	23 98
Keys, locks, etc. . . . .	1 75

Cleaning dispensary and hallway .....	... .	\$10 00
Repairing furniture .....	..	4 50
Repairing urinal .....	..	3 65
One city directory .....	..	5 00
		—
		\$8,923 53

## SMALLPOX EXPENSES TO DECEMBER 31, 1894.

Superintendent of Smallpox Hospital .....	.. \$	390 00
Nurse of Smallpox Hospital.....	..	532 00
Cook and laundress .....	..	305 80
Orderlies, two..	..	675 00
Medical attendance...	..	1,238 00
Medical officers (2), quarantine duty.....	..	400 00
Special officers on quarantine (guard) duty..	..	10 328 25
Vaccine .....	..	1,760 00
Consultations.		51 00
Board of smallpox patients (Poor and Alms Committee of Common Council) .....	..	1,940 41
Rubber goods (disinfecting corps).....	..	26 30
Coal and wood .....	..	140 20
Stoves and fixtures .....	..	44 65
Kitchen utensils .....	..	14 55
Shoes (jail patients).....	..	10 20
Sundry supplies smallpox Hospital .....	..	9 17
Goods destroyed (W. E. Lewis)....	..	24 00
Goods destroyed (J. B. Price) .....	..	18 00
Goods destroyed (Francis Patterson) .....	..	10 25
Groceries, supplies for quarantined houses having smallpox .....	..	\$2,106 67
Meat, .....	.. .. .. ..	706 24
Fish .....	.. .. .. ..	70 40
Tallow .....	.. .. .. ..	82 40
Milk .....	.. .. .. ..	72 40
Food .....	.. .. .. ..	0 96
Outfit disinfecting corps .....	..	16 95
Disinfectants .....	..	30 01
One axe .....	..	1 00
Ice .....	..	73 07
Rent for store, commissary department (55 River street)...	..	54 85
Hospital tents.....	..	343 07
Carpenter work .....	..	160 76

Water rent .	\$17 40
New door for Smallpox Hospital	4 85
Bedding . . . . .	17 00
Paint, whewash, etc., etc	38 86
Feed of horse..	16 82
Drugs . . . . .	95 58
Undertakers' charges.	23 00
Replacing goods destroyed on account of being infected with smallpox	668 70
Horse, wagon and carriage hire	995 80
Repairing ambulance	2 10
Vaccination	2 00
Newspapers .. . . . .	4 08
Clothing, etc., furnished discharged patients, etc .	1 047 83
Liquors	13 00
	-----
	\$24 572 63

## RECEIPTS FOR THE YEAR ENDING DECEMBER, 1894.

Filing plans. . .	\$2,082 00
Scavenger permits	145 20
Animal permits	126 90
Scavenger licenses	300 00
Fines	90 00
	-----
	\$2,744 10

All other fines deposited to the credit of the city of Newark.

## Laboratory of Herbert B. Baldwin.

NEWARK, N. J., Dec. 31, 1894.

*To the Honorable Board of Health of the City of Newark*

GENTLEMEN.—I herewith submit my annual report as Chemist of the Board for the year ending December 31st, 1894.

Since my last annual report the work in my department has largely increased, both in amount and importance. The daily progress in sanitary science, the sophistication of food products due to the constant increase in competition, and the various questions of a chemical nature concerning the nuisances inherent to a large manufacturing city are rapidly widening the scope of chemistry in public health work.

The contents of this report are arranged under the heads of water, milk, miscellaneous analysis and investigations of factory nuisances.

### WATER.

The chemical examination of well water has always formed the major part of the work of this department, and there is really no more important step toward sanitary advancement than the abandoning of contaminated wells. Indeed, it has been asserted that over ninety per cent. of all typhoid fever cases can be traced to either water or milk containing the germs of this disease, and it not infrequently happens that the bacilli are introduced

in the milk by its adulteration or contact with contaminated water.

It is a significant fact, as shown by the table of water analysis accompanying this report, that in over fifteen per cent of all the cases where these wells were used typhoid fever was or had been present, either on the premises or in the immediate vicinity, where neighbors so often make common property of a well.

#### CONTAMINATION OF WELLS.

The pollution of a well usually occurs through infiltration of water holding in solution organic matter derived from the privy vault, cesspool or stable. In cases where the well is widely remote from such points of contamination, is very deep, partly through rock or piped, the average individual insists that the water must of necessity be pure, but analysis often proves the fallacy of such a conclusion. While it is true that in many of these cases, if the water gets a fair filtration through the ground, the danger of serious contamination is reduced to a minimum, there are so many ways by which surface or other drainage may reach such wells that the condition of their contents can only be determined by examination. For instance, a well may be wholly or partly built in rock, and the rock may have seams or fissures leading directly to some cesspool, perhaps quite some distance away, or the topography of the land may be such that waste thrown on the surface many yards off will be washed down to the mouth of the well, or, in the case of a piped well, the sewage may find its way to the pipe and gradually wash a channel next to its outside surface down to the bottom, and then go directly into the water. Sometimes, and a few cases have already come under observa-

tion, a well may be situated on a premises where everything is connected with the sewer, but a break in the drainpipe may bring about a worse condition of affairs than before. Also, mere distance from all possible sources of contamination is not an absolute safeguard against it, for instances have occurred where, by means of colored solutions, springs or wells were found to have direct communication with the surface long distances away and where the water had had little or no filtration.

Notwithstanding the thousand and one chances the deadly microbe has for finding its way into our wells, it should not be inferred that all water from that source is bad. Although, on general principles, the city well may be declared unsafe, there have been quite a number found which analysis showed to be comparatively free from impurity.

#### WATER ANALYSIS.

It is frequently hard to draw a distinct line between what is ordinarily called pure and contaminated water. Strictly speaking there is no natural water that is absolutely pure, but as from a sanitary standpoint there are many substances normally found in water that have no harmful significance and since the object of these examinations was simply to determine its fitness for potable use, the analysis, except in particular cases, was confined to the determination of free and albuminoid ammonia, chlorine, nitrogen as nitrites and nitrogen as nitrates.

To make the significance of these terms more clearly understood a brief account of the chemical changes in a polluted water may be given.

Nitrogen is a very characteristic and constant constituent of sewage and animal waste. This by the aid of bacteria is gradually transformed by successive

stages from its existence in organic combination to harmless inorganic nitrates. First through decomposition of the nitrogenous or albuminoid matter the nitrogen is converted into ammonia, this ammonia is then oxidized to nitrites and these in turn are further oxidized to nitrates. Thus nitrogen in some one or all of the above forms affords a most valuable indication of a contaminated water.

Although the above is the theoretical and usual course of the nitrogen there are so many conditions that modify and determine the rapidity of these different changes from one state of oxidation to another that it is not always easy or possible to determine the character of a water from these data alone. Sometimes the ammonia may pass directly into the condition of nitrates without being first converted into nitrites or it may have gone through the different stages of oxidation in the usual manner and then be reduced back to ammonia again, or it may stop at any one of these stages for months and then suddenly pass to the next.

#### CHLORINE.

Chlorine, which forms about sixty per cent of common salt, is another most useful factor for judging the pollution of water, as salt is a prominent constituent of house sewage.

While the determination of chlorine is a most useful and necessary one in water analysis it is surprising that so much importance has been attached to it by many. The reason for this, I think, is the ease and facility with which it may be estimated by physicians and others who have not the means for making a complete analysis.

There have been many wells pronounced unfit for use simply because they contained considerable salt.

Salt is a natural constituent of the ground and in the lower part of this city the normal amount is quite large. Besides this there are many chances for its accidental introduction into water. A very common cause is the emptying of ice cream freezers on the ground near the well. Several cases have come under my observation where people have put bags of salt in their wells with the idea of purifying the water.

#### BACTERIOLOGICAL EXAMINATION.

In regard to the application of bacteriology to the examination of water it may be said that in the present condition of our knowledge it is an excellent method for use in experimenting on systems of purification, and in particular cases becomes an important aid to the chemical tests, but alone its use is usually limited and unsatisfactory.

#### INTERPRETATION OF RESULTS.

It should be understood that none of the substances mentioned in these analysis are found in sufficient quantity in drinking water to be in the least detrimental in themselves, and their detection and estimation are only useful for indicating the past history and present condition of the organic matter. From the analytical data alone it is sometimes very difficult to form an opinion on the quality of a water and in such cases the environment of the well and any other information obtainable has to be taken into consideration. With all samples of water brought for analysis diagrams and descriptions of the wells have been furnished. These in numerous instances have been a valuable aid in writing an opinion.

In making reports the terms "passable," "suspicious," "very suspicious," "contaminated," "badly contaminated" and "very badly contaminated" have been adopted to approximately designate the degree of contamination, although in exceptional cases it is possible that a water marked suspicious or even passable would be more dangerous to use than a badly contaminated one.

Of the four hundred and twenty-five wells represented in the table of analyses, the proportion of the different grades is graphically illustrated below:

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*Contaminated, 57.17 per cent.*

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*Suspicious, 27.30 per cent.*

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*Passable, 15.53 per cent.*

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#### TABLES.

The analyses of wells will be found in table No. 7, appended to this report. As they have never before been published or collectively reported I have included not only the results of water analyzed throughout the year, but also of samples examined in 1893 and a part of 1892.

Figures are not given for the nitrogen or nitrites, but the terms "small," "excessive" or "very excessive" indicate that the amount was less, more or very much more than .0005 parts per 100,000.

Should it be desired to convert the results into grains per United States gallon it may be done by multiplying them by the decimal .58318.

#### MILK.

This most important article of food does not receive the attention given it in some cities, notably those of

Massachusetts, in which State the requirements and regulations are much more stringent than here.

Our State standard simply requires twelve per cent. of total solids, no regard being had to the amount of fat. This allows considerable latitude to those who are inclined to increase their profits by adding a little water or abstracting considerable cream. Either or both may be done with most good milk without making it fall below the standard.

Milk is such a universal article of diet, especially for infants and the sick, it would seem strange that more attention is not given to the regulation of its sale, and that it should be sold almost exclusively according to quantity and not quality. One man may purchase a quart of milk containing seventy-five per cent. more fat than the same amount bought by his neighbor at the same price, and yet in both cases it is above the standard and unadulterated. It is satisfactory to note that in some places attention is being given to this matter, and that the dealers realize that it is to their interest to separate their milk into two or more grades.

#### THE LACTOMETER.

So much has been said concerning the merits, and otherwise, of this instrument for testing milk that it will suffice to say that it has been the means employed by the inspector for selecting supposedly poor specimens for analysis. How well it has served the purpose in this respect is shown by the results of the analyses. However, the probabilities are that a number of adulterated milks have been missed by its use which would have been detected by taking all samples which looked in the least suspicious, without regard to the lactometer at all.

There have been twenty-two samples analyzed during the year, but two of which proved to be above the standard.

The analytical data will be found in the following table:—

Sample number	Date of Receipt.	Total Solids	Water.	Fat.	Solids not fat.	Remarks.
23	Feb. 12	1. 26	87.7	3.10	7.16	Below the standard.
24	March 15	11.44	88.56	3.26	8.18	" "
25	April 18	10.88	89.12	2.72	8.16	" "
26	April 18	10.55	89.45	2.54	8.01	" "
27	April 24	11.14	88.86	2.79	8.35	" "
28	April 26	11.44	89.27	2.87	8.18	"
29	May 5	11.41	88.59	3.37	8.04	" "
30	June 20	11.02	88.98	2.65	8.37	" "
31	July 11	11.97	88.03	3.19	8.78	" "
32	July 23	11.14	88.80	2.64	8.50	" "
33	July 23	11.33	88.67	2.74	8.59	" "
34	Aug. 11	11.45	88.55	3.24	8.21	" "
35	Aug. 13	11.37	88.63	3.20	8.17	" "
36	Aug. 17	11.67	89.33	1.71	8.96	" "
37	Aug. 20	10.49	89.51	2.63	7.86	" "
38	Aug. 27	11.11	88.89	2.05	8.16	" "
39	Aug. 27	12.35	87.75	3.87	8.48	Above the standard.
40	Aug. 28	10.01	89.99	2.02	7.99	Below the standard.
41	Sept. 13	12.12	87.55	3.59	8.73	Above the standard.
42	Sept. 24	9.25	90.95	2.73	6.42	Below the standard.
43	Sept. 29	11.47	88.60	2.55	7.55	" "
44	Nov. 13	11.28	89.72	2.95	7.33	" "

#### MISCELLANEOUS ANALYSES.

Under this head are included such analyses as have not been mentioned in the tables for water and milk.

#### SARDINES.

The remains of a box of mustard sardines which were supposed to have poisoned some of those who ate them were analyzed, but nothing was found except a trace of tin.

## BRANDY DROPS.

These candies had the appearance of chocolate cream drops, but were flavored strongly with brandy. Two kinds were analyzed and found to be filled with sugar syrup containing about five per cent. of brandy. It is not likely that enough would be eaten to cause intoxication, but by their use children might acquire a taste for liquor.

## CONDENSED MILK

A suspected can of condensed milk was examined for tyrotoxicon, but as the milk kept well and both chemical and physiological tests failed to discover it it was concluded that it was absent.

## DISINFECTANTS.

Two brands of disinfectants for sale on the market were examined and neither found to be up to the standard claimed for it; in fact one was of very little value at all. A sample of carbolic acid was tested and found to be ninety per cent. pure.

## OTHER SAMPLES OF WATER.

Water from a deep well in use at the Essex County Insane Asylum and two samples of city water were analyzed and found to be of excellent quality, although it would be better if the city water contained less albuminoid ammonia.

Examination of a sample of water taken from an old pipe discharging into the canal proved it to be a part of our regular supply.

## INVESTIGATIONS OF FACTORY NUISANCES.

During the year complaint was made that a man in the employ of the Essex Lead Works had been poisoned

by lead fumes while working at an apparatus used in the manufacture of lead pipe. Investigation showed the complaint to have been entirely unwarranted and no fault, from a sanitary point of view, could be found with the apparatus, and from the nature of the process it was not possible for any lead fumes to arise.

Several visits were made to a refinery conducted by D. R. Downer to find some way of overcoming a nuisance caused by smoke and bad odors from the slow burning of photographic waste. This was finally partly abated by a different arrangement and extension of the chimneys.

Some residents near the Cooper Chemical Works claimed that acid fumes from the establishment destroyed vegetation in their gardens and ruined their eyesight. A number of inspections confirmed the fact of the escape of acid vapors which, when the wind was from a certain direction, were very objectionable, but just what damage they caused could not be ascertained. The firm made some improvements in the arrangement of their acid plant and the trouble was obviated to a great extent.

In conclusion I wish to take the opportunity of expressing my appreciation of the many valuable suggestion of the Health Officer and especially for the reports containing special information about the wells which have often been indispensable in making the analytical reports.

Very respectfully,

HERBERT B. BALDWIN,  
*Chemist.*

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## APPENDIX.

*TABLES.*

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MAP  
OF  
THE CITY OF  
**NEWARK**  
STATE OF  
**NEW JERSEY**

Scarlet Fever





# BIRTHS REPORTED DURING THE YEAR 1894.

COLOR.	SEX.	NATIVITY OF PARENTS.						NAME OF CHILD.	LEGITIMACY
		Native.	Foreign	Native.	Foreign	Native.	Foreign		
Total.		White.	Colored.	Male.	Female.	Native.	Foreign	Native.	Foreign
5194	5096	98	2621	2561	12 2005	2334	471	320	3
		Ma. <sup>e</sup>		Not Stated.	Native.	Foreign Father only	Foreign Father only	Nativity of Father only Stated.	Nativity of Mother only Stated.
						Foreign Mother only	Foreign Mother only	Native.	Native.
								5	5
								30	19
								7	7
								3245	1949
								5138	56

## STILL BIRTHS REPORTED.

Total.	Male.	Female	Not Stated.	FATHER.		MOTHER.		COLOR.	
				Native.	Foreign	Native.	Foreign	White.	Colored.
292	173	112	7	112	159	21	125	146	21
				Not Stated.	Native.	Not Stated.	Native.	285	7

## MARRIAGES REPORTED.

### NATIVITY

Total	White.		Colored.		Native.		Foreign.		Not Stated.		First Marriage.		Second Marriage		Third Marriage.		Fourth Marriage.		Not Stated.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
163	158	158	43	42	726	962	697	636	9	34	1281	1288	195	158	12	7	142	177	81	

**NATIVITY OF DECEDENTS.**

United States .....	3,216
Ireland .....	488
Canada .....	6
Germany .....	555
Russia .....	22
Hungary .....	8
England .....	103
Austria .....	22
Switzerland .....	11
Turkey .....	1
Italy .....	34
Scotland .....	20
France .....	12
Poland .....	10
Holland .....	2
Sweden .....	6
Belgium .....	1
China .....	1
Denmark .....	5
Greece .....	1
Finland .....	1
Not Stated .....	18
Native Born .....	3,216
Foreign Born .....	1,309
Not Stated .....	18
Total .....	4,543

**DEATHS IN INSTITUTIONS,**

FOR THE YEAR 1894.

City Hospital .....	165
German Hospital .....	57
St. Barnabas .....	49
St. Michaels .....	191
City Alms House .....	28
Home for the Aged .....	5
Essex County Hospital for the Insane .....	40
" " Jail .....	2
Home of the Little Sisters of the Poor .....	35
Christian Refuge .....	5
Home for Incurables .....	2
The Eye and Ear Infirmary .....	1
House of the Good Shepard .....	3
Isolation Hospital .....	18
Home of the Friendless .....	1
St. Peters Orphan Assylum .....	1
Total Deaths in Institutions .....	603

Tabulated Statement of Deaths for the year 1894, Classification and Enumeration  
of Causes.

<b>CLASSES.</b>	<b>CLASS I</b> ORDERS	<b>CLASS IV</b> ORDERS	<b>Excretive System &amp; Ductless Glands.</b> <b>Urinary System</b> <b>Reproductive System</b> <b>Secretory Part</b> <b>Excretory Part</b> <b>Integumentary System</b>
I Symptomatic Diseases.	Miasmatic Diseases	Constitutional Diseases	
II Parasitic Diseases.	Parasitic Diseases		CLASS V ORDERS
III Diabetic Diseases.	Metabolic Diseases	Developmental Diseases	
IV Chronic Diseases.	Chronic Diseases	Class VI	CLASS VII ORDERS
V Constitutional Diseases	Venereal Diseases	Diseases Nervous System	Accident and Negligence
VI Septic Diseases	Septic Diseases	Organs of Special Sens.	Homicide
VII Local Diseases.		Circulatory System	Suicide
VIII Violence.	Parasitic Diseases	Respiratory System	CLASS VIII ORDERS
IX Ill Defined and Cause not Stated.	CLASS III ORDERS	Digestive System	I. Define I Cause not stated
	Dietetic Diseases		

**CAUSE OF DEATH**

Measures	Variables	Variables
WJLP	Y <sub>1</sub>	X <sub>1</sub>
+	Y <sub>2</sub>	X <sub>2</sub>
+	Y <sub>3</sub>	X <sub>3</sub>
+	Y <sub>4</sub>	X <sub>4</sub>
+	Y <sub>5</sub>	X <sub>5</sub>
+	Y <sub>6</sub>	X <sub>6</sub>
+	Y <sub>7</sub>	X <sub>7</sub>
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+	Y <sub>10</sub>	X <sub>10</sub>
+	Y <sub>11</sub>	X <sub>11</sub>
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+	Y <sub>300</sub>	X <sub>300</sub>

**ORDER 1.**

Sore-pox	1	10	5	2	4	9	1	6	1	1	2	
Tuberculosis	6	7	1	2								2
Infectious Pulmonary	2	51	17	3	2	2	1	8	1	1	1	2
Other Intercurrent Diseases	2	51	15	10	6	1	1	5	1	1	1	1
Whooping Cough	44	19	25	10	14	2	2	5	2	4	2	
Anthrax Vulgaris	1	1										
La Grippe	5	14	16	3					2	6	3	1

**ORDER II**

Cholera Infantum	210	106	164	99	66	43	6	10	2	7	4	6
Dysentery	71	34	37	51	4	7						
Enteric Contus	46	30	26	19	12	9	1	6	2	7	4	7

CLASS I

**ORDER III.**

Malarial Fever	3	5	6	..	1	8	2	2	2	2	1	
Remittent Fever	2	3	3	..								

**ORDER V**

Syphilis, congenital	...	4	1	3	3	..	..	..	1			

**ORDER VI.**

Peritonsilla	2	13	9	..	..	8	2	3	5	1	4	1
Puerperal	2	2	..	..	..	..	..	..	..	..	..	..
Psorosis	2	..	..	..	..	..	..	..	..	..	..	..

**ORDER I.**

Alcoholism, Acute	8	6	2	..	..	..	..	1	2	1	3	1
" Chronic	2	3										
Inanition	46	18	15	2	5							

**ORDER I.**

Anaemia Pernicious	5	2	5	..	..	1	1	1	1	1		
Acute and Chronic	1	1										
Epithelioma V.v.s	1		1									
Carcinoma Endometrium	12	4	10					4	4	2	1	
Lymphosarcoma	5							2	2	1		
Breast	1	1										
Kidney	1	2	1			1	1	1	1	1		

CLASS IV

**Tabulated Statement of Deaths for the year 1894. Classification and Enumeration,  
of Causes. -CONTINUED.**



Tabulated Statement of Deaths for the year 1894. Classification and Enumeration  
of Causes. (CONTINUED)

**ORDER IV.**

CLASS VI

**ORDER V**

Tabulated Statement of Deaths for the Year 1894. Classification and Enumeration  
of Causes, -CONTINUED.

CLASS III	Males	Females	SEX												CLASS V
			Infant	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	
<b>ORDER V.—CONTINUED</b>															
Perrityphlitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perforation of Bowels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Structure of Stomach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ulcer of Stomach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
astro Enteritis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>ORDER VI</b>															
Spleen Abscess	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>ORDER VII.</b>															
Calcus.—Renal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nephritis, Acute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chronic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kidney Calculi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poxosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uremia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>ORDER VIII</b>															
Abscess of Breast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dystocia Adherent Placenta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dropsy Amniotic Sac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
															Colored and Liver

Endometritis	1	+			
Inflammation Uterus	1	2			
Hemorrhage Antepartum	1	+			
Pelvic Peritonitis	1	4			
Hemorrhage Postpartum	1	1			
Luteal Infarction	1	1			
Rupture Ovarian Vein	1	1			
Pregnancy Extra Uterine	1	*			
Peritonitis Peri	2	*			
+ following operation					
Placenta Praevia	2	2			
Septicemia Puerperal	2	*			
Uraemia Puerperal	2	2			
Tumor-Ovarian	1	1			

**ORDER IX.**

Diffuse Abscess of Thigh ..... . . . .

**ORDER 1.**

**Tabulated Statement of Deaths for the Year 1894. Classification and Enumeration  
of Causes. CONTINUED**

CAUSE OF DEATH	Total	Mortality		Years
		Male	Female	
Shock following Operation	-	-	-	1 to 45 Years
" by Lightning.....	-	-	-	10 to 75 Years
" " "	-	-	-	15 to 30 Years
Uterus Irritative ....	-	-	-	1 to 30 Years
Wounds—Abdomen	-	-	-	1 to 30 Years
" Chest .....	-	-	-	1 to 30 Years
<b>ORDER I. CONTINUED</b>				
Strangulation Homicide.	-	-	-	1 to 30 Years
<b>ORDER II</b>				
<b>ORDER III.</b>				
Arsenical Poisoning,	-	-	-	1 to 30 Years
Chloroform Poisoning	-	-	-	1 to 30 Years
" " Acid Poisoning	-	-	-	1 to 30 Years
Phosphorus Poisoning	-	-	-	1 to 30 Years
Hydrogen Gas Poisoning	-	-	-	1 to 30 Years
Opium Poisoning	-	-	-	1 to 30 Years
Drowning	-	-	-	1 to 30 Years
" " " Water of Holes	-	-	-	1 to 30 Years
" Heart	-	-	-	1 to 30 Years
" Chest	-	-	-	1 to 30 Years
Hanging	-	-	-	1 to 30 Years
Wounds of Neck	-	-	-	1 to 30 Years
Injury of Chest	-	-	-	1 to 30 Years

**ORDER I.**



## ACTUAL MORTALITY.

BY DISTRICTS REPRESENTING OLD WARDS.

*From Zymotic and Other Chief Causes.*

Wards.	ESTIMATED POPULATION. 8565 7953 7137 6729 6118 28957 10400 22024 7953 15498 13255 22024 30996 6322 9992 Total 203,923															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
All Causes, All Ages	204	153	113	162	128	660	263	476	132	307	342	536	710	153	204	4,543
All Causes, under 5 Years	30	41	29	61	43	291	89	210	20	131	58	253	365	37	100	1,795
Serous Pox					9			2		3		3	1			18
Measles	1	4	1	4		2	1	10		6		12	2	1	5	49
Scarlatina		2	..	4	2	9	3	9	10	6	10	9	7	7	..	69
L. phteria	1	4	3	3	2	31	7	12	1	15	12	13	62	4	8	180
Whooping Cough	1	1	1	1	2	2	7	..	9	1	2	1	9	6	..	44
Typhoid	2	2	2	1	1	5	2	1	2	1	2	7	2	3	1	34
Malarial Fever	1	..	..	..	2	..	..	..	..	2	2	3	4	..	2	16
Diphtheric Disease	6	6	0	5	83	10	13	4	15	20	30	70	9	28		337
Tuberculosis (Pulmonary)	33	24	15	20	13	73	33	50	17	30	9	57	70	12	23	515
Cerebro Spinal Meningitis	..	1	..	1	4	..	3	2	2	2	3	3	1	1	..	23
Other Zymotic Diseases	4	1	2	1	5	1	5	..	1	1	1	5	20	1	..	47
Marasmus	4	4	3	13	3	30	15	7	2	11	4	27	26	5	9	153
Bronchitis	1	2	3	4	2	9	4	18		5	5	9	10	3	4	77
Pneumonia	28	20	16	21	20	58	35	37	15	35	38	54	85	12	14	488

## WELLS RECORDED.\*

### PRIVY VAULT AND CESS POOLS WITHIN

LOCATION OF WELL	NAME NO.	SINK AND DEPTH.	FOR MANUFACT'G OR DOM. PURPOSES	30 FEET	50 FEET	100 FEET	RESULT OF ANALYSIS
				10 FEET	20 FEET	30 FEET	
Aqueduct St 80 82	215	1 am, 20 Feet	Driven	2 I. V.			Badly Contam.
" 119 . . .	187	Bucket 20'	"	{ 2 C. P. 1 P. V.	.....	.....	" "
Aqueduct St 94 . . .	99	"	"	.....	1 P. V.	.....	" "
" 110-115½	101	Pump 20'	"	{ 1 C. P. 1 P. V.	"	.....	" "
" 114, 114½ . .	126	Bucket 30'	"	2 P. V.	.....	.....	" "
" 116, 118 . .	127	"	"	"	.....	.....	" "
" 120 122	128	"	"	"			Suspicious. Reanalyzed Very Suspicious.
" 124	129	Driven Wells 35'	"	"	.....	....	Very Badly Contam.
" 130	130	Bucket 35'	"		2 P. V.		"
" 174	204	"	"	.....	.....	1 P. V.	Very Suspicious.
" 133	32	Pump 35'	"	.....	{ 2 C. P. 1 P. V.	2 P. V.	" "
Adams St 109	22	Bucket 15'	"	3 P. V.	.....	.....	Very Badly Contam.
" 40 42 . .	137	"	"	{ 1 C. P. 1 P. V.	.....	1 P. V.	" "
" 108 122	163	Pump 14'	Mfg. and Dom.	.....	.....	.....	Suspicious.

\* Very old cases which occurred on premises found in Chemists' Table on account of space.

Adams St 33 . . .	239	Bucket 12'	Domestic	$\begin{cases} 1 C \\ 1 P \\ V \end{cases}$	..	Very Badly Contam
" 21	245	Pump 18'	"	$\begin{cases} 1 C \\ 1 P \\ V \end{cases}$	$\begin{cases} 1 C \\ 1 P \\ V \end{cases}$	" "
" 64	63	Bucket 18'	"	1 C P	3 P V	
Alyea St 28.	141	" 40'	"		1 P V.	
Alms House —	142	Pump 40'	"			
Ashland St 7-9	378	" 25'	"	2 P V	.....	Very Suspicious. Passable Contam.
Abeel St 10 . . .	392	" 25'	"	$\begin{cases} 1 C \\ 1 P, V \end{cases}$	.	Very Badly Contam
" 9	406	" —	"	1 P V	.	" "
Astor St 41 43 . . . . .	404	Bucket 50'	"	.....	$\begin{cases} 1 C \\ 1 P, V \end{cases}$	Passable
Avon Ave 7. . . . .	445	" 30'	"		1 P V.	Suspicious.
Baldwin St 35 41	14	Pump 28'	Domest.c	1 C P.	2 P, V	Passable
" 18	250	" —	"		1 P V	Suspicious
" 20	251	Driven Well	"		1 P, V	Badly Contam.
Brunswick St 69 .	93	Bucket 37'	Domestic		2 P, V	"
" 80	258	" 30'			1 P V.	Passable.
Broad St 329 .	82	Pump —	Domestic.	1 P V	.	Contam.
" 416. . . . .	64	Driven Well 57'	Mfg and Dom.	$\begin{cases} 1 C, P \\ 1 P, V \end{cases}$	$\begin{cases} 2 P, V \\ " \end{cases}$	$\begin{cases} \text{Suspicious, Re Anal} \\ \text{yzed Suspicious Re} \\ \text{Analyzed Contam.} \end{cases}$
" 119. . . . .	81	Bucket —	Domestic.		1 P V	Passable
" 283	98	Driven Well 182'	"	1 P V.	.	"
" 396.	185	Bucket 35'	"		1 P V.	Badly Contam.
" 968-970 . . .	15	P. w.	"		"	Passable.
Bergen St 150 .	82	Bucket 64'	"	1 P V.		Very Suspicious
" 58 . . . . .	244	Pump 25'	"		1 P V	
Bleecker St 154-156 .	44	Bucket 25'	"	1 P V	2 P V	Badly Contam.

**WELLS RECORDED.—CONTINUED.**

**PRIVY VAULT AND CESS  
POOLS WITHIN**

CLASS OF WELL	SAMPLE NO.	KIND AND DEPTH.	FOR MANUFACT'G		10 FEET.	50 FEET.	100 FT.	RESULT OF ANALYSIS
			DOM	PURPOSES.				
Blee ker St, opp. 11	190	Pump	Domestic.	"	"	2 C. P.	2 C. P.	Contaminated
							4 P. V.	
Bowery St 22	6	Pump 30 Feet.	"	"	"	1 P. V.	"	Suspicious,
Belmont Ave 245	50	Bucket 30'	"	"	1 P. V.	"	"	Ba. fly Contaminated
Bowery & Ave 174	80	Pump 80'	"	"	"	"	"	Passable
" 100	194	Bucket 40'	"	"	1 C. P.	1 P. V.	"	
" 106-8 ...	359	" 40'	"	"	2 P. V.	"	"	
" 89 .....	414	" 30'	"	"	"	2 P. V.	"	Suspicious
Bowery St 112.	427	Pump 20'	"	"	1 C. P.	"	"	
					1 P. V.	"	"	
Berlin St 74	123	Bucket 15'	"	"	"	1 P. V.	"	Badly Contaminated.
Barbara St 86	139	Pump 40'	"	"	1 Cow Stable	1 P. V.	"	" "
" 100	396	Bucket 15'	"	"	1 P. V.	"	"	Very Suspicious.
Broome St 33, 35	168	" 15'	"	"	"	"	"	Badly Contaminated.
" 247	262	Pump 35'	"	"	"	1 P. V.	"	
Barnet St 34, 39	197	Bucket 30'	"	"	"	2 "	"	Passable
" 1	198	Pump 30'	"	"	"	1 "	1 P. V.	Badly Contaminated
Bath St 139, 141	218	Bucket 20'	"	"	"	2 "	"	" "
" 520 .....	383	" 60'	"	"	1 P. V.	"	"	Suspicious
" 273	389	" 20'	"	"	"	"	"	Badly Contaminated.

Bank St 32-34	394	Bucket 25'	Domestic,		1 P. V.	1 P. V.	Suspicious.
" 143-145	402	" 19'	"		2 "	"	Passable.
Boyd St 167	228	" 30'	"		1 P. V.		Contaminated.
" 183	439	" 12'	"		1 P. V.		Badly Contaminated.
Barclay St 151 ..	261	" 30'	"		1 P. V.		"
" 108	296	" 30'	"		1 "		"
" 131	455	" 25'	"		1 "		"
Boyden Pl .. .	335	Artesian Well 130'	"		2 "		Passable.
Boyden St 131-133	369	Bucket 50'	"		2 "		
" 21	395	" 40'	"	1 P. V.			Very Suspicious.
Bloomfield Ave 40½-42	386	" 45'	"				Suspicious.
Badger Ave 30	410	Pump 50'	"		1 P. V.		Very Suspicious.
Elmont Pl. 13	424	Bucket 30'	"	1 C. P.	"		Contaminated
Boston St 51	447	" 25'	"	1 P. V.			Very badly Contamin'd
Brenen St 18-20	450	Pump 38'	"	1 C. P.		2 P. V.	Suspicious.
" 22	451	Bucket 25'	"	1 "		1 "	"
Cartaret St 4	78	" 50'	"		2 "		Passable.
Condit St 29	69	" 40'	"	3 P. V.	"		Very badly Contamin'd.
" 70 .. .	149	" 40'	"	4 "		"	"
Crittenden St 17-19	54	" 40'	"				Very Suspicious ..
Columbia St 26-28 ..	5	..	"	2 P. V.			Badly Contaminated ..
				2 C. P.			
" 35	268	" 30'	"		1 P. V.		"
Chambers St 76	8	Pump 20'	"		San. Vault		
Congress St 20-22	212	" 40'	"		1 C. P.	1 P. V.	Badly Contaminated
" 63 .. .	256	Bucket 40'	"	1 P. V.			
				1 C. P.			
" 120	270	Pump 35'	"	2 P. V.			"
" 130	9	Bucket 24'	"		2 P. V.		Contaminated.
" 133	257	" 40'	"	1 C. P.	1 "		Badly Contaminated
Concord St 15-21	10	" 45'	"			2 P. V.	Passable.

**WELLS RECORDED. CONTINUED**

LOCATION OF WELL	SAMP. NO.	SINK AND DEPTH	FOR MANUFACT'G OR DOMESTIC PURPOSES		30 FT	50 FT	100 FT	PRIVY VAULT AND CESS- POOLS WITHIN	
			Domestic	Pump				1 P. V. 1 C. P.	1 P. V. 1 C. P.
Centre Cr. 12	10								
Commerce St 87 89 ...	21	28'		"					
" 161 ...	178	Pump		"	1 P. V. 1 C. P.	....			Contaminated.
" 183 185	384	Bucket 25'		"	2 P. V. 2 C. P.				badly Contaminated
" 187 189 ..	385	" 25'		"	2 P. V. 2 C. P.	....	....	" "	" "
Crawford St 16 .....	468	" 26'		"			1 P. V.	....	Contaminated.
" 50 52	23	" 30'		"					Suspect 45
Court St 70 78	31	Pump 28'		"				3 P. V.	Passable
Central Ave 100 108	275	" 30'		"				2 "	Badly Contaminated
" 113	182	Bucket 35'		"	1 P. V.	1 P. V.			" "
" 182	37	Pump		"		1 "			" "
" 243 245 ..	46	" 11'		"	.....	2 "			Contaminated
Cross St 28	90	Artesian 60'		"	1 C. P.	1 C. P.	1 "	1 "	Badly Contaminated
Crane St 57 .....	96	Bucket 25'		"	.....	....	1 "		Contaminated.

Crane St — .....	102	Bucket 60'	Domestic.		t P. V.	i P. V.	Contaminated
Clinton Ave 395-397	124	" 40'	"	"	"	"	Passable
Chestnut St 222....	162	Pump	"	"	"	"	Badly Contaminated.
" North Canal St 140. ...	179	Bucket 30'	"	"	1 P. V. 1 C. P.	"	" "
Coes Place 19 . . .	352	" 35'	"	"	1 P. V.	"	Suspicious.
" 30. . .	205	Pump	"	"	"	"	Passable.
Camp St 39. . .	224	Bucket 35'	"	"	1 C. P.	"	Badly Contaminated.
" 43 ..	372	" 30'	"	"	2 C. P.	"	Passable.
Clay St 1.... . . .	298	" 60'	"	"	1 P. V.	"	Contaminated.
" 3 . . .	301	" 60'	"	"	"	"	"
" 5 7 . . .	300	" 60'	"	"	"	"	"
" 9 . . .	299	" 60'	"	"	"	"	Very Suspicious.
" 44	456	" 40'	"	"	"	"	Passable.
Canal St 85	440	Pump	"	"	"	"	Badly Contaminated.
Cherry St 24	441	"	"	"	"	"	Suspicious.
Camden St 138	328	Bucket 45'	"	"	"	"	Badly Contaminated.
Clifford St 131	344	Driven 28'	"	"	"	"	Contaminated.
Drift St 25	34	" 104'	"	"	"	"	Badly Contaminated.
" 27 . . .	35	" 150'	"	"	2 C. P.	8 P. V.	Passable
Downing St 61	310	Pump 16'	"	"	"	"	Badly Contaminated.
Duryee St 22-22	225	Bucket 25'	"	"	2 P. V.	"	Contaminated.
" 12	336	Pump 15'	"	"	"	"	Very Suspicious.
Delancey St 66	340	Bucket 10'	"	"	"	"	"
" 75 ..	342	Pump 16'	"	"	"	"	"
" 144	341	"	"	"	"	"	"
" 152	339	"	"	"	1 C. P.	"	"
" 154	343	"	"	"	"	"	"
Dey St 12 14..... .	331	Bucket 18'	"	"	1 P. V. 1 C. P.	"	Suspicious.
Dark Lane 33... .	421	" 27'	"	"	"	"	Passable
Eighth Ave 33-35	116	" 60'	"	"	1 P. V.	"	Suspicious.

**WELLS RECORDED.—CONTINUED.**

LOCATION OF WELL	SAMPLE NO	KIND AND DEPTH.	FOR MANUFACT'G OR DOM. PURPOSES	PRIVY VAULT AND CESS POOLS WITHIN			RESULT OF ANALYSIS
				30 FEET.	50 FEET.	100 F.T.	
Eighth Ave 59	110	Bucket 40'	Domestic.		1 P. V.	1 P. V.	Suspicious.
" 52 54	183	" 25'	"		2 "	2 "	.....
" 46 48	184	Pump 30'	"		2 "	2 "	Contaminated.
" 69 71	115	Bucket 42'	"		2 "	2 "	
" 73 75	114	" 50'	"		2 "	2 "	Suspicious
" 87 89	125	" 30'	"	1 P. V.		1 "	"
" 60 62	267	" 30'	"			1 "	"
" 214	340	" 30'	"			2 "	Badly Contaminated
Elm St 129 . . .	146	" 30'	"	1 P. V. 1 C. P.		" "	98
Elm St 106 108	103	Pump	"		5 "		Contaminated
" 90 92	245	Bucket 20'	"		2 "		Suspicious.
" 95	316	Pump 40'	"		1 "		Badly Contaminated.
" 152	426	" 25'	"	1 P. V. 1 C. P.			Contaminated.
Elm Road 52..	100	"	"		1 "		Passable.
Emmett St 225 227	188	" 24'	"	1 P. V.			Contaminated.
" 172	62	Bucket 21 $\frac{1}{2}$ '	"	1 "			Badly Contaminated.
East Park St 16	240	Pump 40'	"				Very Suspicious.
Last Kinney St 35	280	"	"		1 "		Very Badly Contam.
" 289	321	Bucket	"	1 "			" "
" 291	320	" 15'	"	1 C. P.	1 "		.....

East Kinney St 293 ...	319	Bucket 15'	Domestic.	I C. P.	I P. V.	...	Contaminated.	....
" 299	322	" 15'	"	I C. P.	I P. V.	"	"	"
Eighteenth Ave 226	473	Pump 80'	"	I C. P.	I P. V.	"	Suspicious.	
" 501	479	Bucket 35'	"	I C. P.	I P. V.	"	"	"
Front St 97 99	108	Artesian 75'	Soda Water Manufacturer.	...	I C. P.	I P. V.	.....	.....
" 81-83 . ....	109	Pump 30'	Public	....	....	....	Suspicious.	
" 95 ..... .	177	Driven 70'	Manufacturing Root Beer.	....	I C. P.	I P. V.	"	"
" 21... .	368	Pump.	Domestic.	I C. P.	I P. V.	....	Very Suspicious.	.....
Fifteenth Ave 477	327	Bucket 47'	"	....	I C. P.	I P. V.	"	"
" 481	347	" 48'	"	2 P. V.	....	....	Very Badly Contam.	
" 473 .....	18	" 58'	"	Sewer	I C. P.	I P. V.	"	"
Fifteenth St 345	213	Pump 55'	"	....	2 P. V.	I C. P.	..	Suspicious.
Ferry St 252 254 ..	138	Bucket 30'	"	5 P. V.	I C. P.	I P. V.	....	Contaminated.
" 277 .	271	" 17'	"	I C. P.	I P. V.	I C. P.	....	Very Suspicious.
" 110	201	Pump 30'	"	....	Sanitary Vault.	....	....	Very Badly Contam.
" 307.	332	Bucket 13'	"	....	....	I C. P.	....	"
Frankfort St 106	311	" 14'	"	I C. P.	....	....	....	Suspicious.
Fifth Ave 34 .....	172	" 50'	"	I C. P.	....	....	....	"
Fifth Ave, cor. Clifton av	351	" 71'	"	I C. P.	....	I C. P.	....	"
Ferguson St 73. ....	175	" 18'	"	I C. P.	....	....	....	Very Badly Contam.
				2 P. V.	....	....	....	

**WELLS RECORDED. -CONTINUED.**

**PRIVY VAULT AND CESS-  
POOLS WITHIN**

LOCATION OF WELL,	SAMPLE NO.	KIND AND DEPTH.	FOR MANUFACT'G OR DOM. PURPOSES.	30 FEET	50 FEET	100 FEET	RESULT OF ANALYSIS.
				1 P. V.	1 P. V.	1 P. V.	
First St 27.. . . .	132	Bucket 31'	Domestic	I P. V.	I P. V.	I P. V.	Very Badly Contam.
Fair St 14-20.....	229	Pump 35'	"	I P. V.	I P. V.	I P. V.	Passable.
Gree St 92-94	159	Bucket 31'	"	I P. V.	I P. V.	I P. V.	Contaminated.
Green St 163-165	268	" 40'	"	I P. V.	I P. V.	I P. V.	Very Badly Contam.
George St 81	214	" 20'	"	I P. V.	I P. V.	I P. V.	Contaminated.
Gordon St 85	242	" 18'	"	I P. V.	I P. V.	I P. V.	Very Badly Contam.
" 87	234	Pump 15'	"	I P. V.	I P. V.	I P. V.	Very Badly Contam.
Garrison St 59	261	Driven Well	"	I C. P.	I C. P.	I C. P.	Suspicious.
" 61	282	" "	"	I "	I "	I "	Very Suspicious.
" 64	283	" "	"	I "	I "	I "	" "
" 63	284	" "	"	I "	I "	I "	" "
" 63	285	" "	"	I "	I "	I "	Passable.
" 65	286	" "	"	I "	I "	I "	" "
" 44	307	Bucket 15'	"	I P. V.	I P. V.	I P. V.	Very Badly Contam.
" 46	308	Pump	"	I "	I "	I "	Contaminated.
" 48	306	" 23'	"	I "	I "	I "	Very Badly Contam.
" 52	309	" "	"	I "	I "	I "	Very Suspicious.
Hawthorne St 99	3	" 30'	"	I P. V.	I P. V.	I P. V.	Suspicious.
" 123.....	29	" 27'	"	I P. V.	I P. V.	I P. V.	Badly Contaminated.
" 121....	39	" 25'	"	I "	I "	I "	Very Suspicious.
" 119.....	42	" 25'	"	I "	I "	I "	Passable.
" 117 ..	55	" 25'	"	I P. V.	I P. V.	I P. V.	Suspicious

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Hunterdon St 103 . . . .	73	Bucket 24'	Domestic.	....	1 P. V	Contaminated.
Hudson St 114 . . . .	226	" 55'	"	....	1 P. V.	Passable.
" 120 . . . .	220	" 60'	"	....	1 "	Suspicious.
Hudson St 126-126½	219	" 50'	"	....	1 "	Contaminated.
High St 13 . . . .	57	" 35'	"	....	2 "	1 C. P. Badly Contaminated.
High St 29-31 . . . .	36	" 20'	"	....	2 C. P. 1 P. V.	3 P. V. Very Badly Contam.
High St 180 . . . .	43	" 35'	"	....	1 P. V.	1 P. V. Contaminated.
" 70 . . . .	147	Pump 42'	"	....	3 "	Badly Contaminated.
" 615 . . . .	387	Bucket 40'	"	....	1 "	Passable.
Hermon St 56 . . . .	7	" 23'	"	....	1 C. P. 1 P. V.	... Badly Contaminated.
Hoyt St 43 . . . .	49	" 40'	"	....	2 "	1 C. P. 1 P. V. " "
Halsey St 365 367 . . .	171	" 25'	"	....	1 "	Very Badly Contam.
" 299-301 . . . .	206	Pump	"	....	2 "	Suspicious
" 283 285 . . . .	207	"	"	....	2 "	Very Suspicious.
Holland St 71 73 . . . .	202	" 46'	"	1 "	1 C. P.	Suspicious.
Hecker St 21 . . . .	397	Bucket 42'	"	1 C. P. 1 P. V.	....	Contaminated
Jeffife Ave 323 . . . .	24	" 15'	"	1 "	....	Passable.
Johnson St 14-16 . . . .	145	" 14'	"	1 C. P.	2 "	Badly Contaminated.
" 22-24 . . . .	428	" 30'	"	....	2 "	Suspicious.
" 121 . . . .	436	" 20'	"	2 C. P. 1 "	3 "	Contaminated.
Jefferson St 40 . . . .	230	Pump 45'	"	Sanitary Vault.	....	Suspicious.

## WELLS RECORDED.—CONTINUED.

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LOCATION OF WELL	SAMPLE NO.	TYPE AND DEPTH	FOR MANUFACT'G OR DOM PURPOSES.	PRIVY VAULT AND CESS POOLS WITHIN			RESULT OF ANALYSIS.
				30 FEET.	50 FEET.	100 F'T	
Jefferson St 48	252	Bucket 30'	Domestic	1 C. P.	1 P. V.		Contaminated.
" 101 . . . . .	290	" 40'	"	1 P. V.			Badly Contaminated.
John St 14 . . . . .	181	" 30'	"	2 C. P.	2 "		Suspicious
Kearny St 60 . . . . .	86	Pump	"		3 "		Contaminated.
" 62 . . . . .	85	"	"		4 "		Suspicious
" 64 . . . . .	87	" 20'	"		4 "		"
Kearny St 66-68. . . . .	88	Pump	"	2 P. V.			"
West Kinney Pl 16-18.	117	Bucket 21'	"	{ 2 C. P. 1 P. V.	1 P. V.		Contaminated
" " 22 . . .	118	Pump	"		{ 1 C. P. 2 P. V.		"
" " 26 . . .	119	"	"	1 C. P.	1 P. V.		"
Kossuth St 54	278	Bucket 8'	"			1 P. V.	Very Badly Contam.
Kossuth St 96-98 . . . . .	287	Pump 15'	"			1 "	" "
" 97-97½ . . . . .	238	" 13'	"			1 "	" "
" 155 . . . . .	409	Bucket 14'	"			1 C. P.	" "
Longworth St 17 . . . . .	58	" 30'	"	1 C. P.	1 P. V.		" "
" 10 . . . . .	59	" 30'	"			1 P. V.	Passable.
" 22-24 . . . . .	363	" 35'	"	1 P. V.	1 P. V.		Very Badly Contam.
Lafayette St 128. . . . .	143	" 80'	"	1 P. V.	1 "		" "

Lafayette St 116 118	365	Pump	Domestic	$\begin{cases} 1 C. P. \\ 1 P. V. \end{cases}$	.	.	Very Badly Contam.
Liberty St 26	279	" 35'	"	$\begin{cases} 1 C. P. \\ 1 P. V. \end{cases}$	1 P. V.	" "	" "
" 28	166	" 35'	"	$\begin{cases} 1 " \\ 1 P. V. \end{cases}$	1 "	.	Suspicious
Liberty St 46 48	164	" 34'	"	$\begin{cases} 1 C. P. \\ 1 P. V. \end{cases}$	..	.	" "
" 69	232	" 30'	"	1 "	.	.	Very Suspicious.
" 50,	165	" 35'	"	3 "	.	.	Badly Contaminated.
" 36	167	" 35'	"	$\begin{cases} 1 C. P. \\ 1 P. V. \end{cases}$	1 P. C	" "	" "
Littleton Ave 34	382	Bucket 35'	"	1 C. P.	.	.	Suspicious.
Montclair Ave 110-112	2	" 25'	"	1 C. P.	.	.	"
M. & E. R. R. Ave 45	19	Pump	"	$\begin{cases} 1 " \\ 1 P. V. \end{cases}$	..	.	"
M. & E. R. R. Ave 43	121	Bucket 30'	"	$\begin{cases} 2 C. P. \\ 1 P. V. \end{cases}$	1 P. V.	.	Badly Contaminated.
M & E. R. R. Ave 51-53	48	Pump 35'	"	1 P. V.	.	.	" "
Main St 103	122	" 30'	"	1 "	..	" "	" "
Main St 53-55 ....	448	Bucket 35'	"	$\begin{cases} 2 C. P. \\ 2 P. V. \end{cases}$	.	" "	" "
Monroe St 68	152	" 50'	"	$\begin{cases} 1 C. P. \\ 1 P. V. \end{cases}$	.	" "	" "
" 75	60	Pump 18'	"	$\begin{cases} 1 C. P. \\ 1 P. V. \end{cases}$	.	" "	" "
" 13 ...	333	Bucket 15'	"	1 C. P.	1 P. V.	....	Contaminated.

**WELLS RECORDED.—CONTINUED.**

**PRIVY VAULT AND CESS-  
POOLS WITHIN**

LOCATION & DEPT.	SAMPLE NO.	KIND AND DEPTH.	FOR MANUFACT'G OR DOM. PURPOSES	30 FEET	50 FEET	100 FEET	RESULT OF ANALYSIS
Monroe St 22	345	Bucket 18'	Domestic			1 C P 1 P V	Very Suspicious
" 69 .. . . .	356	Pump	"	1 P. V.	... . . . .		Badly Contaminated.
" 71 .. . . .	357	Bucket 18'	"	.....	1 C P. 1 P V	... . . . .	" "
" 60 .. . . .	367	Pump 16'	"	1 C P. 1 P V.	.....	" "	
Madison St 31	255	Bucket 35'	"	1 C P 1 P V			Very Suspicious
" 27 .. . . .	374	Pump 23'	"	1 "	.....	....	Badly Contaminated
" 110 .. . . .	349	" 16'	"	.....	1 "	Passable.	
" 112 .. . . .	348	" 18'	"	.....	1 "	"	
" 108 .. . . .	253	Bucket 30'	"	.....	1 C P. 1 P V	.....	Contaminated.
" 23 .. . . . .	254	" 50'	"	.....	1 C P. 1 P V.	.....	Passable.
Madison St 132 1321	429	" 25'	"	1 C P. 2 P V.	....		Contaminated.

Mott & Passaic Aves	155	Pump	Domestic.	"	I P. V.	3 P. V.	Very Suspicious. Contaminated Badly Contaminated. Very Suspicious. Very Badly Contam. Suspicious. Badly Contaminated. " " "
Mulberry St 452	189	Bucket 15'	"	"	I P. V.	I C. P.	Contaminated Very Suspicious. Suspicious.
" 456	247	Pump 16'	"	"	I C. P.	I "	Badly Contaminated. " "
" 494	410	" 25'	"	"	...	...	" "
" 450	446	" 30'	"	"	I P. V.	3 P. V.	Very Suspicious. Badly Contaminated. Contaminated
" 440	458	" 30'	"	"	I C. P.	I "	" "
Magazine St 63	265	"	"	"	I C. P.	I "	Badly Contaminated. " "
" 87	266	Bucket 12'	"	"	I "	I "	Passable. Badly Contaminated. Contaminated
McWnorter St 67	317	Pump 40'	"	"	...	I "	" "
" 85	318	Bucket 30'	"	"	I "	I "	" "
" 115	457	" 30'	"	"	I "	I "	" "
Monmouth St 94	417	Pump 30'	"	"	I P. V.	I "	Badly Contaminated.
Morton St 44	431	"	"	"	I P. V.	I "	" "
" 22	454	"	"	"	I "	I "	" "
Newark St 133	27	Bucket 40'	"	"	4 "	4 "	" "
" 105	314	" 35'	"	"	I P. V.	I "	" "
" 79	324	" 30'	"	"	I "	2 "	Contaminated " "
New St 349	112	"	"	"	I "	1 "	" "
New St 351 353	113	" 35'	"	"	I "	2 "	Badly Contaminated. Contaminated.
" 428	221	" 50'	"	"	2 "	2 "	" "
" 348	379	" 34'	"	"	I "	I "	I P. V. Suspicious.
" 365	380	" 25'	"	"	I "	I "	Passable.
Nassau St 34	174	" 50'	"	"	I C. P.	I P. V. ...	" "
" 35 37	201	"	"	"	2 "	2 "	Badly Contaminated. Suspicious.
Norfolk St 92 94	437	" 42'	"	"	I "	I "	Contaminated.
" 54 56	358	" 30'	"	"	I "	I "	Badly Contaminated.
" 157	216	" 50'	"	"	I "	I "	" "
New York Ave 113	243	" 30'	"	"	I "	I "	" "
" 115	233	Pump 25'	"	"	I "	I "	" "
" 263	277	Bucket 12'	"	"	I C. P.	I P. V. "	" "

**WELLS RECORDED.—CONTINUED**

**PRIVY VAULT AND CESS-  
POOLS WITHIN**

LOCATION OF WELL,	SAMPLE No.	KIND AND DEPTH,	FOR MANUFACT'G OR DOMESTIC PURPOSES	30 FEET			RESULT OF ANALYSIS.
				1 P. V.	1 P. V.	100 FEET	
Nesbitt St 18 . . . . .	348	Pump 30'	Domestic				Passable.
N. J. R. R. Ave 247½	349	" 30'	"				Badly Contaminated.
Oxford St 26. ....	350	Driven 30'	"	1 P. V.	1 P. V.		Very Suspicious.
" 34 . . . . .	350	Bucket 50'	"		1 P. V.		Contaminated.
Oxford St 75 77 . . . . .	408	" 16'	"			1 P. V.	"
Ogden St 288 290	51	" 40'	"			{ 2 C. P. 2 P. V.	"
" 343	70	" 25'	"		{ 1 C. P. 1 P. V.		"
" 397 399 . . . . .	91	Pump 30'	"		{ 3 C. P. 3 P. V.	2 P. V.	Badly Contaminated.
" 391 395. ....	92	Bucket	"		{ 1 C. P. 2 P. V.		Contaminated.
Orange St 9 . . . . .	304	" 30'	"		3 P. V.		" . . . . .
Orange St 344 348	323	Pump 45'	"		1 "		Contaminated
Polk St 126 128	4	" 26'	"		1 "		Badly Contaminated
Prospect St 139.	449	Bucket 30'	"				Suspicious.
" 133	13	" 26'	"	2 P. V.			Contaminated.
Prospect Place 33. ....	403	" 30'	"		{ 3 C. P. 1 P. V.		Badly Contaminated.

Pacific St 189 . . .	14	Bucket 15'	Domestic		1 P. V.	Very Badly Contam.
" 117 . . .	28	" 10'	"	1 C. P.	1 "	"
Feshine Ave 99 . . .	15	" 27'	"	"	1 "	Suspicious.
Feshine Ave 215 217	135	" 37'	"	2 P. V.	1 C. P.	Very Suspicious.
" 232 . . .	443	" 25'	"		1 P. V.	Badly Contaminated.
" 222 224 . . .	444	Pump 45'	"		2 C. P. 2 P. V.	Very Suspicious.
Plane St 345	25	" 35'	"		1 "	
" 146 . . .	84	" 25'	"		"	Badly Contaminated.
" 170	412	"	"	1 P. V.	"	Suspicious
" 284 . . .	415	"	"	"	1 P. V.	Contaminated.
Pennington St 180	74	"	"	"	1 "	Passable.
" 115½	136	Bucket 15'	"		1 C. P. 2 P. V.	Badly Contaminated.
" 121-123	190	" 15'	"		2 "	Contaminated
" 113 . . .	157	" 17'	"		2 C. P. 2 P. V.	Suspicious
" 101-101½	158	" 15'	"		1 "	"
Parker St 40 . . .	133	Pump		3 P. V.	"	Badly Contaminated.
" 21 . . .	134	Bucket		2 C. P.	"	Contaminated
				3 P. V.	"	Suspicious.
Paterson St 25 . . .	180	Pump 18'	"		2 C. P. 1 P. V.	Badly Contaminated.
Passaic Ave 259 . . .	289	" 14'	"		1 P. V.	Passable.
Plank Road 701 . . .	353	"	"		"	"
" 693 . . .	354	"	"	1 P. V.	"	Very Suspicious
Prince St 242 244 . . .	425	" 20'	"	1 "	"	Passable
Riverside Ave 3 . . .	153	Bucket 7'	"	1 P. V.	"	"
" 1 . . .	154	" 21'	"	1 C. P.	1 P. V.	Suspicious.
Riverside, near Verona Avenue . . .	375	"	"	"	1 "	Passable.

**WELLS RECORDED.—CONTINUED**

**PRIVY VAULT AND CESS-  
POOLS WITHIN**

LOCATION OF WELL,	SAMPLE NO.,	KIND AND DEPTH,	FOR MANUFACT'G OR DOM. PURPOSES.	30 FEET.			RESULT OF ANALYSIS
				50 FEET.	50 FEET.	100 FEET.	
Riverside, near Grant Avenue ..	423	Bucket 40'	Domestic			1 P. V.	Passable.
River St 63	433	Pump	"	1 P. V.			
" 73 ..	434	"	"	1 P. V.			
River St 55 57	435	Driven 165'	"	1 P. V.			Suspicious
" 87 ..	235	Pump	"	1 "			Contaminated.
Richmond St 11 13	295	Bucket 30'	"	1 C. P.	1 P. V.		Suspicious.
Ridge St 6 ..	420	" 100'	"	1 P. V.			Passable.
Ridge St 17 19	422	" 70'	"	1 C. P.	1 P. V.	1 P. V.	"
Sussex Ave 40	288	Pump 25'	"		1 "		Very Suspicious.
" 70 ..	11	" 20'	"				Badly Contaminated.
Summer Ave 836	12	Bucket 45'	"			1 C. P.	"
" 123	52	" 50'	"			1 P. V.	"
Summer Ave 115 117	53	" 35'	"			1 P. V.	Passable.
" 159-161 ..	67	"	"	1 C. P.	1 P. V.		Contaminated.
" 7 ..	89	Pump	"	1 P. V.	2 "		Suspicious
" 114 ..	148	Bucket 70'	"			2 P. V.	Contaminated.
" 118 120	150	" 40'	"				"
" 138	161	Artesian 720'	"			2 P. V.	"
Seventh Ave 156 ..	26	Pump 70'	"			1 P. V.	Suspicious.
							Very Suspicious.

100

				Domestic.			1 P. V.	3 P. V.	Low Water. Contaminated.
Seventh Ave 172	33	"	Bucket 40'	"	"	1 C. P.	2 "	1 "	"
" 162 . . .	65	"	Bucket 40'	"	"	I	"	"	"
" 32 34 .	66	"	10'	"	"	I	"	"	"
" 155 ..	77	"	40'	"	"	2	"	"	Suspicious
" 140 . . .	100	"	42'	"	"	"	"	"	Passable.
Shipman St 96	36		Artesian 127'	"	"	"	"	"	Badly Contaminated.
" 34 . . .	364	Pump	—	"	1 P. V.	3 "	"	"	"
South 10th St 494	45	"	30'	"	"	I	"	"	Contaminated.
" 521 . . .	169	Bucket	40'	"	"	I	"	"	Badly Contaminated.
" 402 . . .	305	"	25'	"	"	I	"	"	"
" 489 . . .	391	"	55'	"	I	"	"	"	Contaminated.
Sixth Ave 120	71	"	35'	"	{ 1 C. P.	"	"	"	"
"					{ 1 P. V.	"	"	"	"
Sixth Ave 128 130	131	"	30'	"	5 "	"	"	"	Contaminated.
Stone St 42	75	"	30'	"	"	I	"	"	Passable.
" 13	103	Pump	—	"	"	2	"	"	"
Stone St 17 19	104	Bucket	—	"	5 "	1 C. P.	"	"	Contaminated.
" 16 18	105	"	—	"	"	"	2 "	"	"
" 20	106	"	—	"	"	"	2 "	"	Badly Contaminated.
" 32 . . .	132	"	19'	"	"	"	I	"	Contaminated
South Orange Ave 390	107	Pump	50'	"	"	1 P. V.	"	"	Suspicious.
" 425 329 330	Driven 200'			"	"	"	"	"	"
Springfield Ave 398	120	Pump	39'	"	"	I	"	"	Suspicious.
" 592 .	381	Bucket	30'	"	I	"	"	"	"
Strafford Place 104	170	"	—	"	"	I	"	"	Badly Contaminated.
Sherman Ave 133-135	191	"	30'	"	2 "	"	"	"	Very Suspicious.
" 131..	370	"	—	"	I	"	"	"	Passable.
School St 17-19 . . .	200	"	40'	"	{ 1 C. P.	"	"	"	Suspicious.
"					{ 2 P. V.	"	"	"	"
Sixteenth Ave 171.....	203	"	50'	"	I	"	"	"	Contaminated.
" 174.....	390	"	36'	"	I	"	"	"	"
South 11th St . . .	222	"	26'	"	"	I	"	"	"

**WELLS RECORDED.—CONTINUED.**

**PRIVY VAULT AND CESS  
POOLS WITHIN**

CHARACTER OF WELL	SAMPLE NO.	PIPE AND DEPTH	FOR MANUFACT'G OR DOM. PURPOSES	30 FEET.	50 FEET.	100 FEET.	RESULT OF ANALYSIS
				Domestic	I P. V.	I C. P.	
South 11th St 505-507	223	Pump 30'	Domestic		I P. V.	I C. P.	Very Suspicious
" " 401	358	" 32'	"	I P. V.	"	"	Contaminated.
South 2nd St 433-435	418	" 25'	"		I "	"	Suspicious
South 12th St 628 . . .	419	" 35'	"	I "	I "	"	"
South 13th St 15	241	" 23'	"		I "	"	Very Suspicious
South 14th St 22 . . .	411	Driven 70'	"	I "			Passable
South St 156 . . .	241	Pump 20'	"			I P. V.	Very Badly Contam.
" 139	259	"	"			I "	Contaminated
St. Charles St 85-87	246	" 15'	"	I "	I "		Very Badly Contam.
Souvenir St 55	260	" 30'	"		I "	"	" "
Summit St 119	315	Bucket 30'	"	I "			Contaminated.
" 55-57	401	" 30'	"	{ 2 L. P. { 2 P. V.			Very Suspicious.
State St 33-35 . . .	302	" 30'	"		I "		Contaminated.
Sheffield St 93 . . . .	303	" 40'	"	I "	I "		"
" 136 . . . .	304	" 30'	"				"
Sussex Ave 40	288	Pump 25'	"				Badly Contaminated
Stratford Place 9 . . .	413	" —	"		I "		Suspicious
Spruce St 159	459	"	"		I "		Badly Contaminated.
Spruce St 161-163 . . .	460	" —	"				" "
Seabury St 42 . . . .	461	" 50'	"	I C. P.		2 "	Passable.
" 56 . . . .	462	" 50'	"		I C. P.	I "	"
Taylor St 38 . . .	68	Bucket 30'	"		I P. V.		Badly Contaminated.

		Pump	-	Domestic		1 C. P.	2 P. V.	Badly Contaminated.
Taylor St 69...	III	"	35'	"			1 "	Very Suspicious.
Thomas St 98 .	225	"	35'	"			2 P. V.	Passable
Third St 59 . .	313	Driven	112'	"				
" 617 . . .	297	Pump	71'	"		6 "		
Union St 84 . . .	180	Bucket	25'	"	1 "	2 "		Badly Contaminated
" 82 . . . . .	269	"	40'	"	1 "	1 "	1 C. P.	"
" 92 . . . . .	210	"	45'	"	1 "	1 "		"
" 93 . . . . .	292	Pump	40'	"		1 "		Passable.
" 89 . . . . .	293	Bucket	30'	"		1 "		"
" 97 . . . . .	211	"	50'	"	1 "			Very Suspicious.
Vesey St 29 . .	144	Pump	-	"		1 "		Badly Contaminated.
Van Buren St 284 . .	176	"		"	1 P. V.			"
" " 288 . . .	398	"	10'	"	2 "			"
" " 292 . . .	399	"	18'	"	1 "			"
Wallace St 94-96 . . .	20	"	50'	"				
Warren St 330-330½	44	Bucket	45'	"			4 P. V.	"
" 271 . . .	150	"	40'	"	2 "			"
" 217 . . .	355	"	25'	"	1 "			Badly Contaminated
" 335 . . .	361	"	30'	"	1 "			Very Suspicious
" 71 73 . . .	371	"	18'	"	2 "			Badly Contaminated.
" 75 77 . . .	377	"	20'	"			1 "	Contaminated.
" 502 . . .	432	"	50'	"			1 "	Suspicious.
Washington St 441 . .	72	"	30'	"			1 "	"
" 319 . . .	95	"	40'	"			1 "	Contaminated.
" 483 485 . . .	263	Pump		"			1 "	Very Suspicious.
" 410 412 . . .	376	"	35'	"		2 "		"
" 424 . . .	373	Bucket	20'	"		1 "		Passable.
" 451 . . .	393	"	25'	"	4 "	1 C. P.		Contaminated.
Washington Ave 202 . .	78	"	50'	"			1 "	Passable
" 196-198 . . .	76	"	50'	"			2 "	"
" 173 175 . . .	79	"	75'	"			2 C. P.	No Fault.
West St 105 107 . . . . .	140	Pump	35'		1 "		2 P. V.	Suspicious.

III

**WELLS RECORDED. CONTINUED.**

**PRIVY VAULT AND CESS  
POOL WITHIN**

LOCATION OF WELL.	SAMPLE No.	KIND AND DEPTH	FOR MANUFACT'G OR DOM. PURPOSES.	30 FEET.			100 FT.	RESULT OF ANALYSIS.
				30 FEET.	50 FEET.	100 FT.		
West St 6 <sup>n</sup> 6 <sup>f</sup> , . . .	109	Pump 30'	Domestic	1 P. V.				Contaminated.
" 126 . . . . .	430	Bucket 35'	"					"
W. Main St 100 . . . . .	173	" 35'	"	2 "				"
" 138 . . . . .	273	Pump —	"				1 C. P. 1 P. V.	"
" 185 . . . . .	312	" —	"					
West Court St 72 . . . . .	217	" 13'	"	1 "				Passable
West Kinney St 183 . . . . .	227	" 25'	"				1 C. P. 1 P. V.	"
" " 93 . . . . .	264	Bucket 25'	"				1 "	Suspicious
Waverly Ave 348 . . . . .	274	Pump 30'	"				1 P. V.	"
W. 4th St 73 . . . . .	453	" 35'	"				1 "	Very Suspicious
" 79 . . . . .	442	Bucket 35'	"				1 "	Contaminated
W. 4th St 78 . . . . .	337	" 35'	"				1 "	Suspicious

III

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**ANALYSES OF WELLS.**

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## ANALYSES OF WELL WATER.

(PARTS PER 100,000)

SAMPLE NO.	FREE AMMONIA.	ALBUMENOID AMMONIA.	CHLORINE	NITROGEN		NITROGEN AS NITRATES	REMARKS
				AS	NITRITES.		
016	018	6 10	Very excessive				Typhoid Fever
00266	085	3 10	Trace				
3266	086	2 50	Very excessive			1 6	
00106	096	3 1	"				
03772	0105	3 10	Very excessive				
09	0205	4 25	"				
00133	016	7 90	Small			5 6	
5332	6326	5 70	Very excessive				
00333	012	7 80	"				
00133	089	1 70	Small			1 5	
012	015	1 80	Excessive				
00133	086	2 30	Slightly excessive				
00065	032	3 80	Very excessive				
0 55	06	5 6	Very slightly excessive			4 5	
0008	094	3 30	Trace			1 1	
00533	0125	3 30	Small			2 3	
046	025	7 60	Excessive				
004	006	2 10	"			1 2	
000	028	8 90	Small			6 6	
002	009	7 90	Excessive			6 1	
00265	0085	6 10	Small				
Trace	019	12 20	Slightly excessive			5 8	
00133	042	15 40	Very excessive				
008	017	4 00	"				
646	323	14 20	Trace				
00266	0064	3 00	Small			2 0	
0 64	009	2 40	Excessive			2 9	
00133	018	2 10	Trace			1 5	
028	1	4 80	Very excessive				
0 133	008	5 50	Trace			2 7	
0044	7	6 00	Very slightly excessive			1 5	
01533	1 10	1 10	Slightly excessive				
01333	0125	4 10	Very excessive				
00532	025	5 00	Excessive				
0 4	0045	1 40	Small			6	Typhoid Fever
0006	012	10 50	Very excessive			3 4	
002	005	60	Trace			2 2	
00138	011	4 40	Slightly excessive			1 4	
002	012	8 30	Small			1 0	
13333	017	18 70	Very excessive			2 1	
0008	0165	14 00	640			2 5	
002	002	3 10	Excessive			2 3	
002	0045	3 60	"			2 1	
00133	0045	3 70	Trace				
00533	028	23 10	Very slightly excessive				
Trace	010	4 50	Excessive			2 6	
006	007	5 40	"			2 7	
00666	001	15 50	Very excessive			2 7	
002	0075	Trace	Small			0 8	Contaminated
0 006	016	1 00	Excessive			5	
002	007	3 00	Small			3 5	
008	0007	5 00	Very excessive			3 0	
0 53	24 40	" "	"			9 14	
2866	024	8 00	" "			6 80	
00266	0205	15 7	" "			1 60	
0 4+	018	10 0	" "			5	
004	016	15 0	" "			9 20	
004	019	2 4	Excessive			7 4	
006	044	4 2	Very excessive			1 5	
0266	0	1 5	Excessive				
0024	0097	5 6	Small			4 60	
0005	004	5 2	"			2 50	
004	008	5 3	Excessive			3 30	
00133	0104	6 8	Small			5 50	
048	0121	7 2	Very excessive			4 40	
00666	014	6 6	Excessive			10 80	
03333	011	7 0	"			6 00	
00133	009	2 3	Small			2 0	
00532	0205	11 2	Very excessive			3 0	

\*Reanalyzed.

† Not Determined.

**ANALYSES OF WELL WATER. CONTINUED.**  
 [PARTS PER 100,000.]

SAMPLE NO.	FREE AMMONIA	ALBUMENOID AMMONIA	CHLORINE	NITROGEN		NITROGEN AS NITRITES.	REMARKS.
				M	AS		
61	1.33	.035	+	11.3	Very excessive .	11.6	
62	20	.016		6.9	" "	6.7	
63	333+	.035		6.1	" "	2.1	
64	60333	.0055		6.0	Slightly excessive .	4.0	
64*	61333	.005		6.0	Very excessive .	2.0	
65	.065	.018		19.0	Excessive .	1.20	Typhoid Fever
66	.068	.016		6.5	Very excessive .	7.0	
67	.06666	.006		1.5	Slightly excessive .	7.00	
67*	.00466	.009		1.7	" "	1.50	
68	5+	.016		5.4	Very excessive .	3.00	
69	232	.070		10.5	" "	12.00	
70	.0112	.0050		5.0	excessive .	1.0	
71	.08	.042		29.0	Very excessive .	13.0	Typhoid Fever
72	.00133	.0075		4.2	Small .	2.0	
73	.00566	.0115		20.6	Very excessive .	7.0	
74	3+	+		12.5	Excessive .	5.2	Typhoid Fever
75	.004	.007		3.2	" "	2.2	
76	.004	.0055		2.7	" "	2.7	
76*	.0032	.005		2.3	Trace .	2.5	
77	.0144	.0025		2.5	Slightly excessive .	2.5	Typhoid Fever
78	.004	.005		2.5	Excessive .	2.5	
78*	.0028	.003		2.6	Trace .	2.4	
79	.0028	.0025		2.6	Small .	2.5	
80	.00133	.0048		2.6	Trace .	2.5	
81	.00133	.004		2.0	Excessive .	2.0	
82	.004	.011		2.0	" "	2.0	
83	.016	.0055		2.0	Small .	2.0	
84	.0048	.009		2.0	Very excessive .	4.2	
85	.0056	.0105		2.0	Excessive .	10.5	
85*	.004	.011		2.0	" "	2.0	
86	.02866	.010		2.7	Excessive .	2.5	Typhoid Fever
87	.00133	.0055		2.4	Trace .	2.7	
87*	.00133	.011		2.2	Slightly excessive .	2.5	
88	.0008	.016		2.0	Small .	1.3	
89	.0016	.013		1.9	" "	2.0	
90	.150	.013		7.7	Very excessive .	4.2	
91	5+	.034		21.0	Excessive .	10.5	
92	.004	.0155		8	" "	2.0	
93	.00133	.017		7.1	Small .	5.8	
94	Trace	.0055		4.2	Excessive .	1.0	
95	.0072	.014		5.5	" "	5.0	
96	.00533	.0195		5.8	Very excessive .	2.0	
97	.002	.0085		6.6	Small .	2.0	
98	.004	.009		6.0	Excessive .	2.4	
99	.008	.012		2.9	Small .	6.0	
100*	Trace	.006		6.7	" "	1.2	Typhoid Fever
101	.004	.009		10.0	Slightly excessive .	3.0	
102	.00133	.0145		8.9	Very excessive .	5.0	
103	.001	.0105		5.8	Trace .	2.8	
104	.525+	+		5.7	Very excessive .	3.5	
105	.0032	.018		7.2	Slightly excessive .	2.0	
106	.0033+	.022		6.3	Very excessive .	1.5	
107	Trace	.010		4.8	Small .	1.5	
108*	.	.011		4.3	" "	2.0	
109	.008	.0055		1.9	Excessive .	2.2	
110	.00133	.0055		7.2	Lightly excessive .	6.5	
111	.00533	.025		2.0	Very excessive .	4	
112	.00533	.021		8.3	" "	3.5	
113	+	+		12.2	" "	2.25	
114	.003	.012		5.1	Small .	2.5	
115	.004	.007		4.5	Excessive .	2.25	
116	.040	.022		3.5	Slightly excessive .	4.5	Typhoid Fever
117	.004	.022		3.0	Excessive .	5.0	" "
118	.004	.022		3.0	" "	2.9	
119	.004	.0165		6.1	Very excessive .	4.0	
120	.00133	.0105		4.2	Excessive .	2.0	
120*	.0029	.010		6.3	Small .	2.0	
121	.016	.001		7.5	Very excessive .	5.5	
122	2+	+		15.4	" "	1.2	Typhoid Fever
123	.06+	.023		2.9	" "	2.0	

\* Reanalyzed.

† Not Determined.

**ANALYSES OF WELL WATER. CONTINUED.**  
 [PARTS PER 100,000.]

NUMBER	TYPE	ALK. BROMIDE	CHLORINE	NITR. GEN.		REMARKS
				AS	NITRATES	
124	0008	0085	2.5	Slightly excessive	1.4	Typhoid fever
125	002	1105	2	Normal	2.5	"
126	003%	009	2	Excessive	5.1	"
127	004	006	2	Slightly excessive	2.7	"
128	004	008	2.4	"	2.1	"
129*	008	008	2	Very slight	3.0	"
129	1333	.0215	12.2	"	4.8	Typhoid fever
130	66	019	4.6	Very excessive	5.1	"
131	002	1	2.4	Excessive	2.5	"
132	012	1	2.4	Very excessive	6.8	Typhoid fever
133	0045	008	2	Very slight	5.0	"
134	0032	0045	4	Slightly excessive	1.8	"
135	0065	015	2	Excessive	2.5	"
136	90	.15	4.7	Very excessive	3.0	"
137	2.66+	+	2.0	Excessive	1.2	"
138	053+	015	2	Very excessive	4.8	"
139	25+	+	22.0	"	2.5	"
140	Trace	0075	0.1	Normal	2.0	Typhoid fever
141	0.5%	008	5	Very excessive	4.0	"
142	002	005	1.8	Normal	2.5	"
143	30	30	6.5	Very excessive	6.0	"
144	2+	002	6.0	Excessive	2	"
145	800+	+	11.0	Very excessive	16.00	"
146	1.5	+	2.0	Normal	11.00	"
147	033+	015	2.4	Very excessive	1.60	Typhoid fever
148	0062+	010	4.5	"	5.30	"
149	046	020	12.0	Excessive	6.80	"
150	00533	0115	4.4	Excessive	2.20	"
151	75+	+	12.8	Very excessive	3.50	"
152	012	013	2.8	"	2.5	"
153	004	0045	1.6	Normal	1.6	"
154	.002	009	1.5	Excessive	6.7	"
155	00266	010	2.5	Slightly excessive	1.00	Typhoid fever
156	25+	0115	6.5	Excessive	4.00	"
157	053+	.05	9.2	"	3.00	"
158	Trace	0085	1.5	Trace	1.00	"
159	004	010	1	"	1.00	"
160	004	010	1.9	slightly excessive	1.30	"
161	15+	+	36.0	Excessive	11.00	"
162	.0008	0135	2.5	Very excessive	1.50	"
163	0053	0145	2.0	Excessive	5.0	"
164	004	0075	6.8	Slightly excessive	2.6	"
165	0048	0115	6.1	Very excessive	2.9	"
166	004	026	0	Excessive	4.5	"
167	004	012	2.0	Slightly excessive	5.1	"
168	00922	020	2.8	Very excessive	2.5	"
169	2.5+	+	2.5	"	12.0	"
170	.00266	008	2.1	Excessive	1.65	Typhoid fever
171	00533	0145	3.8	"	2.2	"
172	0012	0125	1.8	Normal	2.5	"
173	1.53	+	5.4	Very excessive	5.0	"
174	440	029	12.5	"	2.5	"
175	Trace	0025	17.0	Normal	5.0	"
176	001	.006	17.0	Very excessive	2.0	"
177	260	014	9.2	"	5.0	"
178	001	.29	1.0	Excessive	2.0	"
179	Trace	0155	7.3	Slightly excessive	4.5	Typhoid fever
180*	10	.019	11.8	Normal	8.5	"
181	00133	0075	4.9	Excessive	5.32	"
182	001	022	3	"	22.5	"
183	0048	018	5.2	"	2.0	"
184	016	0105	5.2	"	2.8	"
185	2+	+	20.0	Very excessive	1.0	"
186	004	026	4.5	Excessive	2.7	"
187	053+	0105	5.8	Very excessive	2.5	"
188	1+	+	4.5	Excessive	2.4	"
189	022	0075	8.0	"	2.5	"
190	Trace	016	1.4	Excessive	6	"
191	004	0115	4.2	Slightly excessive	1.5	Typhoid fever

\* Reanalyzed.

† Not Determined.

## ANALYSES OF WELL WATER.—CONTINUED

[PARTS PER 100,000.]

No.	FREE AMMONIA	ALBUMENOID AMMONIA	HUMIC ACID	NITROGEN		REMAKES.	
				AS			
				NITRITES	NITRATES		
192	.012	.0145	7.0	Slightly excessive...	6		
193	Trace	.007	1.0	Small .....	0		
195	.0013	.0105	11.6	Very excessive .....	6.8	Typhoid Fever	
197	.0008	.004	5	Small .....	35		
198	+	+	3.4	Very excessive .....	04		
199	.02	.007	6.4	Excessive .....	> 09		
200	.009	.01	3	Slightly excessive .....	2.3		
201	.0196	.009	10.9	Excessive .....	6.5		
202	Trace	.0125	4.4	Small .....	3.2		
203	.0233	.012	4.8	Small .....	2.4		
204	.0053	+	7.1	Very excessive .....	6.0		
205	.004	.005	4.5	Small .....	2.4		
206	.014	.012	5.1	Excessive .....	2.7		
207	.04	.014	4.6	.....	4.5		
208	.004	.012	4.1	.....	1.8		
209	Trace	.014	10.6	Slightly excessive .....	1.8	Typhoid Fever	
210	.15	+	10.6	Excessive .....	5.8	" "	
211	.0053	.011	10.6	.....	1.5		
211*	.004	.007	10.6	.....	4.0		
212	.004	.011	10.6	.....	2.4		
213	.0053	.007	10.6	Very excessive .....	2.4		
214	.8+	+	10.6	.....	2.5		
215	.056	.020	10.6	.....	2.5		
216	5+	+	10.6	Small .....	2.5		
217	.0026	.005	2.11	Very excessive .....	5.8		
218	.04	.015	4.1	.....	2.0		
219	.0026	.015	5.0	Slightly excessive .....	2.0		
220	.004	.0105	4.0	Small .....	2.5		
221	.006+	.004+	5.0	Very excessive .....	2.5		
222	.026	.019	1.9	.....	2.0		
223	.002	.007	9.1	Slightly excessive .....	2.0		
224	.0046	.012	2.9	Excessive .....	2.0		
225	.008	.017	4.1	Very excessive .....	2.0		
226	.0032	.008	1.3	Small .....	2.0		
227	None	.003	2.4	Excessive .....	2.0		
228	.0056	.019	2.3	.....	2.0		
229	.04	.016	9.5	.....	2.0		
230	.0032	.010	1.6	.....	2.0		
231	.0066	.013	2.4	Small .....	2.0		
232	.004	.013	4.2	.....	1.5		
233	.810	.016	9.6	.....	1.0		
234	.790	.016	4.0	Very excessive .....	5.0		
235	.008	.015	1.3	Excessive .....	1.0		
237	.0015	.007	2.6	Small .....	5.0		
238	.004	.0065	6.2	Excessive .....	2.5		
239	.28+	+	16.9	Very excessive .....	5.0		
240	.004	.009	6.6	Excessive .....	1.8		
241	+	+	11.0	Very excessive .....	5.0		
242	.026	.012	4.4	.....	2.8		
243	5+	+	6.6	Excessive .....	4.0		
245	.0053	.020	2.6	Very excessive .....	1.3		
246	12+	.019	14.0	.....	2.5		
247	.080	.009	4.6	.....	2.5		
248	.009	.009	4.7	Small .....	2.0		
249	.002	.011	5.0	Excessive .....	2.0		
249*	.0015	.0185	4.8	Small .....	5.0		
250	.004	.010	5.8	Trace .....	1.5		
251	.044	+	5.9	Very excessive .....	2.0		
252	.00133	.011	9.8	Slightly excessive .....	4.5		
253	.002	.015	2.3	Very excessive .....	2.0		
254	Trace	.005	1.9	Small .....	2.0		
255	.008	.011	4.7	Slightly excessive .....	2.0		
256	.00133	.0075	4.5	.....	2.0		
257	14+	+	4.0	Very excessive .....	2.0		
258	Trace	.005	4.8	Small .....	2.0		
259	.008	.017	5.2	Very excessive .....	2.0		
260	.625+	+	14.0	Excessive .....	2.0		
261	.16+	.035	10.6	Slightly excessive .....	2.0		
263	.0032	.010	5.0	.....	2.0		

\* Reanalyzed.

† Not Determined.

ANALYSES OF WELL WATER.—CONTINUE  
 [PARTS PER 100,000.]

SAMPLE NO.	FREE AMMONIA	AMMONIUM	NITRATES	NITROGEN		NITROGEN AS NITRITES	NITROGEN AS NITRATE		
				NITROGEN					
				AS	NITRITES				
264	0.0	0.05	+	Trace					
265	0.8	2.1	-	Very excessive		8.8	Typhoid Fever		
266	0.53	0.21	8.5	Excessive		8.5			
267	0.584	0.07	0.68	Slightly excessive		0.68			
268		0.19	11.0	Very excessive		11.0			
269	2	0.05	1.2	Very excessive		2			
270*	1.7	0.1	-	Slightly excessive					
270	0.2	0.1	-	Small		0.2			
271	1.0	0	-	Slightly excessive		1.0			
272	1.25	-	-	Slightly excessive		2.0			
273	0	-	-	Slightly excessive		0.5			
274	0.05	0.05	0.5	Very excessive		2.5			
275	0.5	0.2	6.2	Very excessive		2.5			
276	0	0.2	0.2	Very excessive		0.5			
277	0	0	0	Very + slightly excessive		0			
278	0	0	0	Very excessive		0			
279	0.0	-	-	Excessive		0			
280		0.05	0.5	Very excessive		4			
281	1.1	0.0	0.1	Very excessive		1			
282	0.4	0.05	0.5	-		2.5			
283	0	0.1	0.1	-		2.5			
284	0	0.05	0.2	Excessive		1.0			
285	0.045	0.0	0.1	Small		0.8			
286	0.05	0.05	0.1	-		0			
287	1.28	-	-	-		1			
288	2	0.0	0.1	Very excessive		4			
289	Trac	0.05	0.1	Very excessive		0			
290	0	0.05	-	Trace					
291	0	0.0	-	Excessive		0			
292	0.1	0.0	-	Slightly excessive		0			
293	0.2	0.0	-	Small		0			
294	0.05	0.05	0	Trace					
295	0	0.1	0	No trace					
296	0.15	0.1	0.5	Very excessive		1			
297	Trace	0.05	0.1	Very excessive		0			
298	0.05	0.0	0.1	Small		0.0			
299	0.05	0.0	0.1	Excessive		0			
300	0.05	0.0	0.1	Excessive		0			
301	*	0.0	0.1	Excessive		0			
302	0	0.0	0.1	Small		0			
303	0.05	0.0	0.1	Excessive		0			
304	0.05	0.0	0.1	Very excessive		0			
305	0.2	0.1	0.5	Excessive		2			
306	0.05	0.0	0.0	Excessive		0.0			
307	0.05	0.0	0.0	Very excessive		0.0			
308	0.05	0.0	0.0	Excessive		0.0			
309	*	0.0	0.0	Excessive		0			
310	0.05	0.0	0.0	Excessive		0.0			
311	0.05	0.0	0.0	Very excessive		0.0			
312	0.05	0.0	0.0	Excessive		0.0			
313	0.05	0.0	0.0	Excessive		0.0			
314	0.05	0.0	0.0	Excessive		0.0			
315	0.05	0.0	0.0	Excessive		0.0			
316	0.05	0.0	0.0	Excessive		0.0			
317	0.05	0.0	0.0	Excessive		0.0			
318	0.05	0.0	0.0	Excessive		0.0			
319	0.05	0.0	0.0	Excessive		0.0			
320	0.05	0.0	0.0	Excessive		0.0			
321	0.05	0.0	0.0	Excessive		0.0			
322	0.05	0.0	0.0	Excessive		0.0			
323	0.05	0.0	0.0	Excessive		0.0			
324	0.05	0.0	0.0	Excessive		0.0			
325	0.05	0.0	0.0	Excessive		0.0			
326	0.05	0.0	0.0	Excessive		0.0			
327	0.05	0.0	0.0	Excessive		0.0			
328	0.05	0.0	0.0	Excessive		0.0			
329	0.05	0.0	0.0	Excessive		0.0			
330	0.05	0.0	0.0	Excessive		0.0			
331	0.05	0.0	0.0	Excessive		0.0			
332	0.05	0.0	0.0	Excessive		0.0			
333	0.05	0.0	0.0	Excessive		0.0			
334	0.05	0.0	0.0	Excessive		0.0			
335	0.05	0.0	0.0	Excessive		0.0			
336	0.05	0.0	0.0	Excessive		0.0			
337	0.05	0.0	0.0	Excessive		0.0			
338	0.05	0.0	0.0	Excessive		0.0			
339	0.05	0.0	0.0	Excessive		0.0			
340	0.05	0.0	0.0	Excessive		0.0			
341	0.05	0.0	0.0	Excessive		0.0			
342	0.05	0.0	0.0	Excessive		0.0			
343	0.05	0.0	0.0	Excessive		0.0			
344	0.05	0.0	0.0	Excessive		0.0			
345	0.05	0.0	0.0	Excessive		0.0			
346	0.05	0.0	0.0	Excessive		0.0			
347	0.05	0.0	0.0	Excessive		0.0			
348	0.05	0.0	0.0	Excessive		0.0			
349	0.05	0.0	0.0	Excessive		0.0			
350	0.05	0.0	0.0	Excessive		0.0			
351	0.05	0.0	0.0	Excessive		0.0			
352	0.05	0.0	0.0	Excessive		0.0			
353	0.05	0.0	0.0	Excessive		0.0			
354	0.05	0.0	0.0	Excessive		0.0			
355	0.05	0.0	0.0	Excessive		0.0			
356	0.05	0.0	0.0	Excessive		0.0			
357	0.05	0.0	0.0	Excessive		0.0			
358	0.05	0.0	0.0	Excessive		0.0			
359	0.05	0.0	0.0	Excessive		0.0			
360	0.05	0.0	0.0	Excessive		0.0			
361	0.05	0.0	0.0	Excessive		0.0			
362	0.05	0.0	0.0	Excessive		0.0			
363	0.05	0.0	0.0	Excessive		0.0			
364	0.05	0.0	0.0	Excessive		0.0			
365	0.05	0.0	0.0	Excessive		0.0			
366	0.05	0.0	0.0	Excessive		0.0			
367	0.05	0.0	0.0	Excessive		0.0			
368	0.05	0.0	0.0	Excessive		0.0			
369	0.05	0.0	0.0	Excessive		0.0			
370	0.05	0.0	0.0	Excessive		0.0			
371	0.05	0.0	0.0	Excessive		0.0			
372	0.05	0.0	0.0	Excessive		0.0			
373	0.05	0.0	0.0	Excessive		0.0			
374	0.05	0.0	0.0	Excessive		0.0			
375	0.05	0.0	0.0	Excessive		0.0			
376	0.05	0.0	0.0	Excessive		0.0			
377	0.05	0.0	0.0	Excessive		0.0			
378	0.05	0.0	0.0	Excessive		0.0			
379	0.05	0.0	0.0	Excessive		0.0			
380	0.05	0.0	0.0	Excessive		0.0			
381	0.05	0.0	0.0	Excessive		0.0			
382	0.05	0.0	0.0	Excessive		0.0			
383	0.05	0.0	0.0	Excessive		0.0			
384	0.05	0.0	0.0	Excessive		0.0			
385	0.05	0.0	0.0	Excessive		0.0			
386	0.05	0.0	0.0	Excessive		0.0			
387	0.05	0.0	0.0	Excessive		0.0			
388	0.05	0.0	0.0	Excessive		0.0			
389	0.05	0.0	0.0	Excessive		0.0			
390	0.05	0.0	0.0	Excessive		0.0			
391	0.05	0.0	0.0	Excessive		0.0			
392	0.05	0.0	0.0	Excessive		0.0			
393	0.05	0.0	0.0	Excessive		0.0			
394	0.05	0.0	0.0	Excessive		0.0			
395	0.05	0.0	0.0	Excessive		0.0			
396	0.05	0.0	0.0	Excessive		0.0			
397	0.05	0.0	0.0	Excessive		0.0			
398	0.05	0.0	0.0	Excessive		0.0			
399	0.05	0.0	0.0	Excessive		0.0			
400	0.05	0.0	0.0	Excessive		0.0			
401	0.05	0.0	0.0	Excessive		0.0			
402	0.05	0.0	0.0	Excessive		0.0			
403	0.05	0.0	0.0	Excessive		0.0			
404	0.05	0.0	0.0	Excessive		0.0			
405	0.05	0.0	0.0	Excessive		0.0			
406	0.05	0.0	0.0	Excessive		0.0			
407	0.05	0.0	0.0	Excessive		0.0			
408	0.05	0.0	0.0	Excessive		0.0			
409	0.05	0.0	0.0	Excessive		0.0			
410	0.05	0.0	0.0	Excessive		0.0			
411	0.05	0.0	0.0	Excessive		0.0			
412	0.05	0.0	0.0	Excessive		0.0			
413	0.05	0.0	0.0	Excessive		0.0			
414	0.05	0.0	0.0	Excessive		0.0			
415	0.05	0.0	0.0	Excessive		0.0			
416	0.05	0.0	0.0	Excessive		0.0			
417	0.05	0.0	0.0	Excessive		0.0			
418	0.05	0.0	0.0	Excessive		0.0			
419	0.05	0.0	0.0	Excessive		0.0			
420	0.05	0.0	0.0	Excessive		0.0			
421	0.05	0.0	0.0	Excessive		0.0			
422	0.05	0.0	0.0	Excessive		0.0			
423	0.05	0.0	0.0	Excessive		0.0			
424	0.05	0.0	0.0	Excessive		0.0			
425	0.05	0.0	0.0	Excessive		0.0			
426	0.05	0.0	0.0	Excessive		0.0			
427	0.05	0.0	0.0	Excessive		0.0			
428	0.05	0.0	0.0	Excessive		0.0			
429	0.05	0.0	0.0	Excessive		0.0			
430	0.05	0.0	0.0	Excessive		0.0			
431	0.05	0.0	0.0	Excessive		0.0			
432	0.05	0.0	0.0	Excessive		0.0			
433	0.05	0.0	0.0	Excessive		0.0			
434	0.05	0.0	0.0	Excessive		0.0			
435	0.05	0.0	0.0	Excessive		0.0			
436	0.05	0.0	0.0	Excessive		0.0			
437	0.05	0.0	0.0	Excessive		0.0			
438	0.05	0.0	0.0	Excessive		0.0			
439	0.05	0.0	0.0	Excessive		0.0			
440	0.05	0.0	0.0	Excessive		0.0			
441	0.05	0.0	0.0	Excessive		0.0			
442	0.05	0.0	0.0	Excessive		0.0			
443	0.05	0.0	0.0	Excessive		0.0			
444	0.05	0.0	0.0	Excessive		0.0			
445	0.05	0.0	0.0	Excessive		0.0			
446	0.05	0.0	0.0	Excessive		0.0			
447	0.05	0.0	0.0	Excessive		0.0			
448	0.05	0.0	0.0	Excessive		0.0			
449	0.05	0.0	0.0	Excessive		0.0			
450	0.05	0.0	0.0	Excessive		0.0			
451	0.05	0.0	0.0	Excessive		0.0			
452	0.05	0.0	0.0	Excessive		0.0			
453	0.05	0.0	0.0	Excessive		0.0			
454	0.05	0.0	0.0	Excessive		0.0			
455	0.05	0.0	0.0	Excessive		0.0			
456	0.05	0.0	0.0	Excessive		0.0			
457	0.05	0.0	0.0	Excessive		0.0			
458	0.05	0.0	0.0	Excessive		0.0			
459	0.05	0.0	0.0	Excessive		0.0			
460									

## ANALYSES OF WELL WATER.—CONTINUED

[PARTS PER 100,000.]

SAMPLE NO.	FREE AMMONIA	ALBUMENOID AMMONIA	CHLORINE	NITROGEN		REMARKS
				AS	NITRITES. NITRATES.	
410	Trace	010	5	Trace	5	
415	001	011	2 2	Small	5 5	
416	004	020	12 2	Excessive	8 0	
417	012	030	10 0	Very excessive	12 0	
418	None	006	4 1	Small	8 2	
419	005	007	2 6	Trace	2 0	
420	001	008	6 6	Small	8 2	
421	005	0075	1 3	Excessive	2 2	
422	001	009	2 2	Slightly excessive	5 0	
423	002	0085	2 6	Small	2 4	
424	0026	013	2 6	Excessive	7 0	
425	006	021	10 5	Very excessive	11 0	
426	1 394	030	21 0	" "	8 0	
427	2 445	056	16 0	" "	2 3	
428	0 010	010	11 0	" "	8 0	
429	005	008	5 5	Excessive	1 5	
430	014	023	7 7	"	7 0	
431	004	012	5	"	4 2	
432	00225	009	5 5	"	4 2	
433	009	048	34 0	"	14 0	
434	053	015	12 5	Very excessive	7 5	
435	0065	0056	74 0	Trace	6 0	
436	001	007	17 4	Very excessive	8 0	
437	1 67	023	1 4	"	1 1	
438	003	013	6 0	Excessive	5 0	
439	0015	0056	8 8	Trace	2 0	
440	299	015	9 6	Very excessive	5 5	
441	004	008	2 0	Small	2 5	
442	Trace	007	None	"	2 5	
443	019	019	4 5	Excessive	5 0	
444	002	025	1 8	Slightly excessive	2 0	
445	001	0045	6 0	Small	1 7	
446	3015	012	4 6	Trace	5 5	
447	J.	015	7 0	Excessive	9 0	
448	005	015	9 3	Small	5 5	
449	012	01	9 3	Excessive	8 5	
450	304	0125	4 5	"	3 0	
451	002	006	1 5	Slightly excessive	6 0	
452	001	007	1 5	"	6 1	
453	Trace	0035	8 8	Trace	4 5	
454	027	088	11 0	Excessive	8 0	
455	9 6	068	9 4	"	7 5	
456	003	0095	5 2	Slightly excessive	4 5	
457	002	006	2 5	Small	2 5	
458	002	006	2 0	"	3 0	
459	079	023	7 0	Very excessive	3 5	
460	016	015	11 0	Excessive	4 5	
461	1 75+	+	17 0	Very excessive	10 0	
462	055	014	8 4	"	6 5	
463	0035	012	5 5	Trace	8 0	
464	004	006	6 3	Slightly excessive	3 5	
465	004	007	14 5	Very	3 5	
466	005	010	6 4	Slightly	5 5	
467	001	0065	11 0	Small	11 0	
468	016	014	31 0	Excessive	7 0	
469	159+	+	28 0	"	16 0	
470	005	007	12 5	Very excessive	10 0	
471	002	011	9 5	Small	8 5	
472	001	005	3 5	"	8 0	
473	042	018	3 0	Very excessive	2 2	
474	0015	0035	3 2	Small	1 5	
475	334+	+	8 0	Very excessive	12 0	
476	017	015	4 5	Excessive	2 2	
477	52+	025	25 5	Very excessive	12 0	
478	015	014	5 5	Excessive	5 0	
479	016	012	13 0	Very excessive	2 5	
480	002	0055	13 0	Slightly	1 3	
481	029	010	13 0	Very	6 3	
482	0015	0075	6 0	Excessive	4 0	

\* Reanalyzed

+ Not Determined

ANALYSES OF WELL WATER. CONTINUED.  
 [PARTS PER 100,000]

SAMPLE NO.	FREE AMMONIA.	ALBUMINOID AMMONIA.	CHLORINE.	NITROGEN		REMARKS
				AS	AS NITRITES	
415	.001	.005	1.8	Slightly excessive	1	
416	.00	.05	2.0	Excessive	1.0	
417	.0005	.014	2.9	"	12.0	
418	.002	.010	3.9	Trace	.05	
419	.002	.0055	3.7	Small	7.0	
420	.003	.007	1.5	"	1.0	
421	.005	.0145	7.5	Trace	1	
422	.002	.011	7.0	Excessive	3.0	
423	.013	.00	1.2	Small	1.0	
424	.018	.0095	4.1	Very excessive	2	
425	.004	.007	1.0	Excessive	1	
426	.003	.0155	10.2	"	5	
427	.0055	.015	6.6	Very excessive	6.0	Typhoid Fever
428	.004	.015	1.0	Excessive	1.0	" "
429	.002	.013	6.5	Very excessive	4.0	" "
430	.0014	.024	2	"	4.2	
431	375+		4.1	"	6	
432	.007	.11	1.4	"	1.0	
433	Trace	.07	1.2	Small	2.5	
434	.001	.10	1.4	"	5.5	
435	.015	.0045	11.1	Very excessive	4.5	
435*	.010	.0055	11.0	"	2.5	
436	.010	.011	4.1	Excessive	2.5	
437	.002	.0.5	"	"	4	
438	.005	.0.6	3.0	Very excessive	3.0	
439	.013	.023	1.2	"	3.0	Cistern
440	200+	+	8.0	"	11.0	
441	.0065	.011	4.4	Excessive	1	
442	.010	.018	4.0	Small	3.4	
443	.034	.015	6.8	Very excessive	5.0	
444	.005	.008	5.2	"	2.5	
445	.004	.0055	5.2	Small	5	
446	.029	.009	1.1	Very excessive	8.0	
447	200+	+	5.4	Trace	1.0	
448	15+	+	1.4	Very excessive	0	
449	.0025	.011	4.2	Small	5.0	Typhoid Fever
450	.001	.010	1.0	"	1.0	
451	.005	.010	2	"	7.0	
452	.001	.0045	4.4	Very excessive	1.5	
453	.006	.014	5.0	None	6.0	
454	.4+	+	4.8	Very excessive	5.0	
455	.42	.020	5.2	Small	2.5	
456	.002	.009	1.5	Trace	3.0	
457	.005	.017	Trace	None	0.05	Cistern.
457*	.001	.015	6.0	Trace	5.0	
458	.0005	.015	3.6	Slightly excessive	3.0	
459	.017	.021	12.4	Excessive	6.1	
460	.003	.021	10.5	"	5.5	
461	.001	.0055	1.6	Small	1.0	
462	.002	.0045	2.2	"	1.5	

\* Reanalyzed.

+ Not Determined.

***ENUMERATION OF COW STABLES.***

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## COW STABLES IN CITY.



## COW STABLES IN CITY CONTINUED.

Feshine Ave 19	52' F't	No	Occasionally in summer	City	Cesspool	1 x 1'	2 Frame	Doors & Wind's	Plank	Mixed	Feed	4 Fair	No Yes
" 23.	34'		" "	"	To pit	1x1"	1 Frame	"	"	"	"	"	"
" 66	62'		" "	"	Floor & ground	12x20'	1 Frame	"	"	"	"	"	"
Peat, cor. S. 15th St	42'		Confined	Well	Cesspool	18x24' ex 12x15'	1 Frame	"	"	"	"	"	"
Prospect Place 2., Dealer	25'	"		"	City	"	2 frame and 2 Ext	12	"	"	"	"	"
Prince St. 102	25'			"	Sewer	21x24' ex 12x15'	1 Frame	"	"	"	"	"	"
Pierce St. 31	75'	"	Occasionally in summer	Well	Cesspool	25x25'	2 Frame	"	9 Plank & Brick	"	4 Fair	"	"
Paterson St. 68	23'		Confined	"	"	18x25'	1 Frame	"	Plank	"	15	"	"
Passaic Ave 161	48'			"	"	12x25'	1 Fr. poor cond'n	"	"	"	"	"	"
Roseville Ave 165	120'	"	Occasionally in summer	Well and City	Sewer	20x34'	1 Frame	"	"	"	"	"	"
" 408 - Farm	5'	Ex'e	Yes all times	Well	Ground	25x34'	1 Frame	"	"	"	"	"	"
Richmond St. 17 19, Dealer	42'	No	Confined	City	Sewer	25x35'	1 Frame	"	EARTH & PLANK	"	16 Good	"	"
Rose St. 235	30'			"	"	"	Frame	"	Plank	"	9	"	"
Sandford St. 160	88'			"	Cesspool	28x31'	1 Frame	"	"	"	"	"	"
Springfield Ave 702	25'			"	Ground	30x31'	1 Frame	"	"	"	"	"	"
" 498	12'	Yes	" "	Well & Cist'n	Sewer	20x30'	1 Frame	"	"	"	"	"	"
So. Orange Ave 8 - Dealer	35'	No	Confined	City	"	22x14'	2 story Frame	L & W. apartm	"	"	"	"	"
So. Orange Ave 372	65'		Occasionally in summer	Well	To Ground	16x26'	1 Frame	Doors & Wind's	"	"	"	"	"
So. Orange Ave 439	150'	Yes	" "	"	"	16x25'	1 Frame	"	"	"	"	"	"
Second Street Farm	100'		At all times	City	Cesspool	12x14' ex 9x11'	1 Frame	"	"	"	"	"	"
Second AVE 24	35'	No	Summer month	"	"	1 x 20'	1 Frame	"	"	"	"	"	"
South Sixth St 18	94'			"	"	10x17'	1 Fr. Shed, p'r cond	"	"	"	"	"	"
South Eighth St 393	4			"	"	12x18'	1 story Frame	"	"	"	"	"	"
" 191	2'	Yes		"	Well	14x20'	1 Frame	"	"	"	"	"	"
N. Lth St 366	58'			"	Ground	14x20'	1 Frame	"	"	"	"	"	"
" Tenth St 473	27'			"	Cesspool	14x20'	1 Frame	"	"	"	"	"	"
" Eleventh St 231	12	No		"	Ground	12x25'	1 Fr. poor cond'n	"	"	"	"	"	"
" " 985	56'			"	Well	12x25'	1 Fr. poor cond'n	"	"	"	"	"	"
" Twelfth St 446	32'			"	Cesspool	13x29'	1 Frame	Door	"	"	"	"	"
So. 3rd St. near 18th Ave	12'			"	"	22x12'	1 Frame	Door & Wind's	"	"	"	"	"
South Fourteenth St 76	24'			"	City	17x26'	1 Frame	Door	"	"	"	"	"
So. 15th St. near 15th Ave	74'			"	Wall	11x15'	1 Frame	Door & Wind's	"	"	"	"	"
So. 15th St. near 16th Ave	80'	"		"	Cesspool	18x21'	2 Frame	"	"	"	"	"	"
South Eighteenth St 385	50'			"	Ground	18x28'	1 Frame	"	"	"	"	"	"
" " 473	59'			"	Cesspool	18x28'	1 Frame	"	"	"	"	"	"
" " 588	66'			"	Ground	12x12'	1 Frame	"	"	"	"	"	"
" " 688	21'			"	Cesspool	12x16'	1 Frame	D. & W. and ce	"	"	"	"	"
So. 19th St. near Spring field Ave Farm	200'	Yes		Well	Clatern	9x10' ex 12x10'	1 Frame	Door & Wind's	"	"	"	"	"
So. 19th St. near Spring field Ave	12'	No		"	Gr'd rear of St.	20x40'	2 Frame	"	"	"	"	16	"
16th Ave, cor. Holland St	22'	"		"	Cesspool	12x20'	1 Frame	"	"	"	"	"	"
Third St. 282	24'	"		"	City	18x25'	1 Frame	"	"	"	"	"	"
" 386	24'	"		"	Well	11x17'	1 Frame	"	"	"	"	"	"
Van buren St 82	8'	"		"	Ground	15x40'	1 Frame	"	"	"	"	"	"
" 86	40'	Ex'e		"	City	14x25'	1 Frame	"	"	"	"	"	"
Varnum St 18	34'	"		"	Sewer	10x14'	1 Frame	"	"	"	"	"	"
Woodside Av. n't Carteret	19'	Yes	"	"	Cesspool	50x25'	2 story Frame	"	"	"	"	2	Good
" "	"			"	Ground	15x20'	1 Frame	"	"	"	"	3	Fair
West Kinney St 165	28'	No	Confined	City	Sewer	10x15'	1 Frame	"	"	"	"	"	"
" "	28'			"	"	25x20'	story Frame	"	"	"	"	"	"
Warren St 508	45'	Ex'e	Out + summer months	Well	To pit	20x23'	2 story Frame	"	"	"	"	"	"
Westcott St 70.	44'	No	Confined	City	Sewer	16x30'	2 Frame	"	"	"	"	"	"
Wall St 28	50'	"			Sewer	24x30'	2 Frame	"	"	"	"	15	Good

# Meteorological Observations taken at Newark, N. J., January 1894.

BY PROF. G. C. SONN VOL OBSERVER U. S. WEATHER BUREAU

ATE	Daily Mean Barometer	Temperature			Daily Mean Humidity,	Prevailing Direction	Velocitv miles per hour	Daily Precipitation	GENERAL ITEMS
		Max	Min	McFn	per C	W.	Maxim. m.	in.	
1	30.166	31	29	30	76	S. W.	12	0	Mean Barometer, 30.166 inches
2	30.25	32	28	31	76	S. W.	12	0	Highest Barometer, 30.25, on 17th
3	30.25	34	30	33	74	S. W.	12	0	Lowest Barometer, 29.75, on 30th
4	30.25	33	31	32	73	S. W.	12	0	Minimum Daily Temperature, 30.2
5	30.25	35	33	34	73	S. W.	12	0	Mean Temperature, 30.2
6	30.25	34	32	33	74	S. W.	12	0	Highest Temperature, 34
7	30.25	33	31	32	74	S. W.	12	0	Lowest Temperature, 31
8	30.25	34	32	33	73	W. N. W.	9	0	Least Daily Range of Temperature, 3
9	30.25	34	32	33	73	S. N. W.	12	0	Greatest Daily Range of Temperature, 42°
10	30.25	32	30	31	73	N. N. E.	20	0.08	Least Daily Range of Temperature, 3
11	30.25	32	30	31	73	N. N. E.	18	0.0	Mean Daily Range of Temperature, 3
12	30.25	34	32	33	74	N. W.	12	0	Total Precipitation, 1.92 in.
13	30.25	33	31	32	74	S. W.	12	0	Minimum Relative Humidity, 68 per cent.
14	30.25	33	31	32	74	S. W.	12	0	Prevailing Direction of Wind, S. W.
15	30.25	32	30	31	74	S. E.	12	0.20	Number of Days, 1
16	30.25	34	32	33	74	S. W.	12	0.0	Number of Cloudy Days, 1
17	30.25	33	31	32	74	S. E.	12	0	Number of Rainy Days, 1
18	30.25	34	32	33	74	S. W.	12	0	Number of Cloudy Days, 1
19	30.25	33	31	32	74	S. W.	12	0	Total Number of Days in which Rain or Snow Fell, 13
20	30.25	32	30	31	74	S. W.	12	0	Length of Streaks, 0
21	30.25	32	30	31	74	S. W.	12	0.00	Mean Max. Temp., 34
22	30.25	33	31	32	74	S. W.	12	0	Mean Min. Temp., 31
23	30.25	34	32	33	74	N. N. E.	12	0	
24	30.25	35	33	34	74	S. W.	12	0	
25	30.25	34	32	33	74	S. W.	12	0	
26	30.25	35	33	34	74	S. W.	12	0	
27	30.25	34	32	33	74	S. W.	12	0	
28	30.25	35	33	34	74	S. W.	12	0	
29	30.25	34	32	33	74	S. W.	12	0	
30	30.25	35	33	34	74	S. W.	12	0	
31	30.25	34	32	33	74	S. W.	12	0	
Total Means	30.166	31	29	30	73.2		12	0.02	

Average Temperature for 2 years, 32°

Average Precipitation for 2 years, 1.60 in.

\* T indicates Type of Precipitation      \* Iain and Mixed Snow.

## REMARKS.

Maximum wind velocity 30 miles.

Total Snowfall 7.6 inches

Hal. on 24th

Aurora on 2d, 5th

Lunar Halos, 20th, 23d

# Meteorological Observations taken at Newark, N. J., February 1894.

BY PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU.

TE.	Daily Mean Barometer	Temperature	Daily Mean Humidity	Prevailing Direction of Wind	Average Velocity Miles per Hour	Daily Maximum	Precipitation*	GENERAL ITEMS	
	Max	Min	Mean						
1	30.01	31	26	27.5	76 per C	S. W.	20	0.07 in. S	Mean Barometer 30.15 inches.
2	30.22	33	20	26.5	58	S. W.	16	0	Highest Barometer 30.81 inches.
3	29.54	41	29	15.0	55	S. W.	6	0	Lowest Barometer 29.16 inches.
4	29.60	35	22	23.5	84	N. W.	16	0.088	Monthly Range of Barometer .13 inches.
5	30.15	34	6	16.0	56	N. W.	16	0	Mean Temperature 2° 60'
6	30.45	58	9	22.0	83	S. W.	12	0	Highest Temperature 78° on 10th
7	30.32	43	24	33.5	62	S. W.	12	0	Lowest Temperature 7° on 1st
8	29.98	51	24	42.5	72	S. W.	12	0	Monthly Range of Temperature 29°
9	29.98	53	24	39.0	90	N. " E.	20	0.48	Greatest Daily Range of Temperature 30° on 17th.
10	29.88	43	21	41.5	74	Variable	20	0.09	Least Daily Range of Temperature 3° on 3rd
11	29.14	44	29	31.5	57	W. S. W.	10	0	Total Daily Range of Temperature 39°
12	29.05	28	29	24	79	S. E.	10	0	Mean Daily Range of Temperature 1°
13	29.06	23	23	21.0	9	S. E.	10	0	Total Daily Range of Humidity 7 per cent
14	29.45	96	5	54	73	N. V. E.	10	0.098	Mean Daily Relative Humidity 74 per cent
15	29.41	33	23	29.0	80	N. W.	10	0.098	Precipitation Duration of Wind S. W.
16	29.29	24	10	18.5	51	N. W.	8	0	Number of Wind Days 9
17	29.41	57	11	18.5	69	S.	8	0	Number of Wind Days 9
18	29.65	92	72	42.0	27	S. W.	20	0.3	Number of Cloudy Days 1
19	29.13	60	3	45.5	84	S. W.	8	0.82	1 Total Day during which Rain or Snow Fell 12.
20	29.15	47	23	41.0	61	S. W.	12	0.10	Thunder Storm, 9th 22m
21	29.11	46	24	29.0	61	N. W.	20	0	Mean Max. Temperature 35.1°
22	29.20	96	23	29.0	65	S. W.	12	0	Mean Min. Temperature 20.8°
23	29.32	29	72	20.0	48	N. W.	20	0	
24	29.07	2	4	18.5	63	S. W.	20	0	
25	29.67	22	1	10.5	75	N. W.	12	1.46	Average of 7 A. M. temperature 25.7°
26	29.95	23	18	25.4	43	N.	20	0	Average of 2 P. M. temperature 33.7°
27	29.48	96	17	26.8	71	N. E.	16	0	Average of 8 P. M. temperature 29.5°
28	30.30	41	22	33.0	74	S. W.	5	0	Average temperature, based on these figures, 29.4°
Total Means		20.15	35.1	20.4	27.8	70		5.10 in.	

## REMARKS.

Total Snowfall 13.92 inches.  
Snowfall, February, 1893, 26.25 inches.

Brilliant Aurora on 23d.  
H. C. on 13th. C. ironia on 17th.

Average of 7 A. M. barometer readings 30.16 inches.  
Average of 2 P. M. barometer readings 30.12 inches.  
Average of 8 P. M. barometer readings 30.18 inches.

Mean Temperature of 1893 February 24.4°  
• Rain and Melted Snow

Precipitation, February 1893 5.34 in

\* T Indicates Type of Precipitation  
S Indicates Snow

# Meteorological Observations taken at Newark, N. J., March 1894.

BY PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

DATE	DAILY MEAN	TEMPERATURE	DAILY MEAN	PREVAILING	DAILY	GENERAL ITEMS	
	BAROMETER.	MAX MIN	MEAN	HUMIDITY.			
					MAXIMUM		
1	30.114	25	34.0	79 per cent	S. W.	6	Mean Barometer 30.1 inches
2	30.002	36	34	44.5	S. W.	36	Highest Barometer 30.7 inches, 7 A. M., 28th
3	30.308	49	39	44.0	S. W.	26	Lowest Barometer 29.6 inches 9 P. M., 13th
4	30.519	54	29	41.5	S. W.	12	Monthly Range of Barometer .97 inches.
5	30.420	57	32	44.5	S. W.	14	Mean Temperature, 43°
6	30.192	70	49	55.0	S. S. W.	21	Highest Temperature, 58° on 6th
7	30.097	69	46	53.0	N. W.	15	Lowest Temperature, 38° on 25th
8	30.073	48	35	41.5	N. E. E.	10	Monthly Range of Temperature, 51°
9	30.162	46	34	40.0	N. N. E.	10	Greatest Daily Range of Temperature, 30° on 6th
10	30.229	51	28	44.5	S. N. E.	9	Least Daily Range of Temperature, 5°, on 28th
11	30.998	32	29	45.5	Variable	15	Mean Daily Range of Temperature, 18°
12	29.977	34	31	47.5	S. W.	15	Total Precipitation, 1.94 inches.
13	29.789	50	34	42.0	S. E.	20	Mean Daily Relative Humidity,
14	29.87	47	34	41.5	S. W.	45	Precipitating Direction of Wind, S. W.
15	30.106	34	26	32.1	Variable	11	Number of Foggy Days, 1
16	30.917	54	2	44.5	S. W.	9	Number of Clear Days, 10
17	30.241	57	39	48.0	S. E.	15	Number of Fair Days, 14
18	30.171	55	36	50.5	S.	10	Number of Cloudy Days, 7
19	30.926	69	49	59.0	W. S. W.	20	Total Number of Days on which Rain or Snow Fell, 12
20	30.310	58	39	45.5	E.	12	Thunder Storm, 1st.
21	30.650	58	40	49.0	N. E.	12	Mean Max. Temperature 53°
22	30.987	67	45	56.0	Variable	30	Mean Min. Temperature 35°
23	30.777	53	19	45.5	S. N. W.	35	Snowfall 0.30 inches
24	30.140	48	32	40.0	E.	20	
25	29.917	4	35	41.3	S. N. W.	5	
26	30.059	56	26	31.0	S. W.	34	
27	30.374	53	17	26.0	S. W.	30	
28	30.497	42	23	32.5	S.	24	
29	30.048	39	13	36.0	S. S. W.	35	
30	30.105	51	1	41.0	W. S. W.	24	
31	29.999	62	33	47.5	S.	20	
Total Means		30.111	52.6	34.7	43.7	67 per cent	
							1.94 in

Average Temperature for 2 years previous, 35°  
• Rain and Melted Snow

Average Precipitation for 2 years previous, 3.96 inches.

\* T indicates Trace of Precipitation.

Solar halo with the sun dogs, and three distinct bows, one being inverted on 28th, 5 P. M.

Aurora, brilliant, on 10th

Lunar halo, 4th, corona 17th, 19th.

Killing frost, numerous toward end of the month.

Barometer average, 7 A. M., 30.147.

Barometer average, 2 P. M., 30.074.

Barometer average, 9 P. M., 30.112.

General Summary. The month was the warmest March ever recorded in Newark, and records go back fifty years. There was no snowfall, and this has occurred but twice before in the same time.

**Meteorological Observations taken at Newark, N. J., April 1894.**  
 BY PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU.

DATE	Daily Mean	Temperature	Daily Mean	Precipitation	Daily	GENERAL ITEMS			
	Barometer	Max	Min	Mean	Humidity	Direction of Wind	Miles per Hour	Maximum	Precipitation
1	29.81	66	46	54.0	51per C	S.W.	35	0.00 in	Mean Barometer 30.06 inches
2	30.69	44	34	41	48	N.N.W.	30	0.09	Highest Barometer, 30.63 inches on 30th.
3	30.57	44	24	34	41	S.S.E.	24	0.00	Lowest Barometer, 29.68 inches on 11th
4	29.95	65	53	43	47	S.S.W.	20	0.58	Monthly Range of Barometer, 0.915 inches
5	29.95	68	41	56	68	W.	40	0.00	Mean Temperature, 44°
6	30.09	65	37	42	58	W.N.W.	40	T.S.	Highest Temperature, 88° on 21st
7	30.17	62	51	56	64	Variable	15	0.10 R & S	Lowest Temperature, 24° on 4th
8	30.12	41	32	38	46	N.N.W.	30	0.05	Monthly Range of Temperature, 54°
9	30.29	62	50	51	49	N.N.E.	30	0.00	Greatest Daily Range of Temperature, 32° on 16th.
10	30.12	42	33	37	50	S.E.	24	0.50	Least Daily Range of Temperature, 40° on 1st
11	29.64	46	32	34	38	N.N.E.	40	0.04 R & S	Mean Daily Range of Temperature, 18°
12	29.87	40	32	36	39	N.N.E.	20	0.07 R & S	Total Precipitation, 2.62 inches
13	29.90	57	37	47	63	N.N.W.	30	0.00	Mean Daily Relative Humidity, 63 per cent.
14	29.92	50	37	45	55	N.W.	20	0.00	Percent of Days on which Rain or Snow fell, 1
15	29.36	65	47	56	56	S	15	1.30	Number of Days on which Wind
16	30.10	70	58	64	55	Variable	15	1.4	Number of Days on which Wind
17	30.17	60	44	52	50	S.E.	20	0.00	Number of Clear Days, 4
18	30.20	63	44	54	65	S.E.	20	0.00	Number of Half Cloudy Days, 8
19	30.12	64	46	53	56	S.E.	10	T	Number of Cloudy Days, 8
20	29.96	61	42	52	69	S.E.	15	0.13	Total Number of Days on which Rain or Snow fell, 1
21	29.81	71	53	62	74	S.E.	20	0.08	Thunder Storm, 20th
22	29.81	62	46	54	57	W.E.W.	15	0.24	Mean Maximum Temperature, 58°
23	28.60	65	41	52	65	W.	24	0.00	Mean Minimum Temperature, 40.1°
24	29.98	60	46	53	60	N.W.	20	T	
25	30.15	62	46	57	58	N.W.	18	0.00	
26	30.14	74	44	59	68	S.W.	15	0.00	
27	30.62	78	50	64	64	S.W.	20	0.00	
28	29.95	73	56	64	75	S.W.	15	0.03	
29	30.27	65	48	56	57	S.E.	24	0.00	
30	30.40	64	41	53.5	60	S.S.E.	24	0.00	
<b>Total Means</b>		30.35	58	40.1	49	66per C		2.62 in	

**REMARKS.**

Killing frost as late as the 9th

Last snow storm on 12th.

2.25 in. snow on 11th.

Total snow of the month, 2.5 in.

Ice 1/2 in. thick on 9th.

Lunar halo on 15th

Mean of 7 A. M. temperature, 44.8°

Mean of 7 A. M. barometer, 30.6 in

Mean of 2 P. M. temperature, 56.7°

Mean of 2 P. M. barometer, 30.00 in.

Mean of 9 P. M. temperature, 48.1°

Mean of 9 P. M. barometer, 30.06 in

Highest temperature on record for April, in Newark,  
official 82.5° in 1846.

Lowest temperature on record for April, in Newark,  
official 17° 1857

\* T Indicates Trace of Precipitation

\* S indicates Snow

Average Temperature for 3 years, 49°

\* Rain and Melted Snow.

Average Precipitation for 3 years 8.53 inches

**Meteorological Observations taken at Newark, N. J., May 1894.**  
 BY PROF. G. C. SPOHN, VOL. OBSERVER, U. S. WEATHER BUREAU

DATE.	Daily Mean	Temperature	Daily Mean	Prevailing	Velocity	Daily	GENERAL ITEMS.
	Barometer	Max Min Me'n	Humidity.	Direction of Wind	Miles per Hour	Maximum.	
1	29 98	64 56 5	76 5	S per	20	0 1r	Mean Barometer 29 986 in. less on 12th
2	29 76	64 60 7	74 3	S W	24	.00	Highest Barometer, 29 988 in. less on 4th and 20th
3	29 181	74 68 63 5	66	E	24	.00	Dowest Barometer, 29 801 in. less
4	29 187	60 49 54 1	59	S E	20	T	Monthly Range of Barometer, 0 98 inches
5	29 074	68 48 58 0	81	S E	10	0 08	Mean Temperature, 61 6°
6	29 771	81 51 66 0	76	S	24	0 60	Highest Temperature, 81° on 6th
7	29 803	78 61 69 5	65	S. W.	20	0 10	Lowest Temperature, 78° on 29th
8	29 832	79 59 .49	57	S W	24	.00	Monthly Range of Temperature, 22°
9	29 681	76 54 65 0	60	N W	20	0	Lowest Daily Range of Temperature, 18° on 1st
10	29 582	68 51 59 5	58	S	9	0	Lowest Daily Range of Temperature, 6 on 20th and 8 at
11	29 361	64 49 59 0	64	Variable	12	T	Mean Daily Range of Temperature, 15°
12	29 365	76 45 60 0	70	N. N. E.	12	.00	Total Precipitation, 1 17 inches
13	29 115	81 54 69 1	47	W. N. W.	20	.00	Mean Daily Range of Humidity, 15%
14	29 194	72 51 65 5	54	S. W.	20	T	Mean Daily Range of Wind, F. S. E.
15	29 221	74 45 59 0	43	S. W.	20	.00	Prev. Day's Total Rain, F. S. E.
16	29 222	75 47 61 0	54	E. S. E.	15	0 00	Number of Rainy Days
17	29 733	67 56 69 5	73	E. S. E.	10	T	Number of Fair Days, 9
18	29 257	75 55 63 0	56	F	15	0 40	Number of Cloudy Days, 1
19	29 213	66 57 64 5	53	S. E.	15	.00	Total Number of Days in which Rain or Snow Fell,
20	29 072	64 51 57 5	53	S. E.	10	0 16	Thunderstorms, 1st and 20th
21	29 164	53 49 52 0	59	S. E.	15	0 40	Mean Max. Temperature, 65°
22	29 125	53 46 49 1	56	S. N. E.	12	0 40	Mean Min. Temperature, 52°
23	29 911	71 63 69 0	83	S. E.	12	0 1	
24	29 687	60 54 57 0	52	F	20	0 80	
25	29 614	66 61 68 5	79	W	20	.07	
26	29 874	63 54 61 5	52	N. W.	10	0 00	
27	29 950	71 64 63 5	51	S. E.	15	0 00	Parhelion, 31st
28	29 433	71 55 43 0	54	W	24	0 82	Solar Halo, 3rd
29	29 914	71 43 57 0	51	S. W.	24	.00	Solar Corona, 5th
30	29 699	60 47 56 5	44	S. E.	20	0 10	Lunar Halo, 15th
31	29 758	67 51 54 0	53	N. E.	15	0 10	Lunar Corona, 15, 14, 13,
	Total Means	29 966	70 4 5. C 61 1	71 per cent		1 13 in	Scintillating Stars, 17.

Average Temperature for 2 years previous 59 8°

\* Rain and Melted Snow.

Average Precipitation for 3 years previous 4 66 in

\*T indicates Trace of Precipitation.

# Meteorological Observations taken at Newark, N. J., June 1894.

BY PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU.

DATE.	Daily Mean	Temperature	Daily Mean	Prevailing Direction of Wind.	Velocity	Daily	GENERAL ITEMS	
	Barometer.		Humidity		Miles per Hour	Maximum		
	Max	Min	Me'n					
1	29.70	62	48	56	63 per C	8. W.	24	0 8 in
2	29.67	70	49	60		S. W.	24	0 37
3	29.74	75	62	64		W. S. W.	15	0 06
4	29.72	81	57	69		W. S. W.	20	0 16
5	29.46	67	51	59		N. W.	12	0 06
6	29.95	56	49	53		S. S. W.	20	1 26
7	29.84	67	47	57		N. W.	20	0 00
8	30.10	73	48	61		S. W.	10	1 00
9	30.03	79	55	67		S. W.	15	0 00
10	29.17	85	56	71		W.	10	0 00
11	30.11	92	67	80		S. W.	10	0 00
12	30.06	83	68	76		W.	12	0 00
13	30.19	71	60	66		E	2	
14	30.27	78	52	65	Variable	12	0 00	Mean Barometer, 29 60 inches.
15	30.15	83	55	69		S. W.	24	Highest Barometer, 30 33 inches on 14th
16	29.95	86	60	71		S. W.	24	Lowest Barometer, 29 64 inches on 2d
17	29.97	90	68	79		S. W.	10	Monthly Range of Barometer, 0 69 inches.
18	30.00	88	70	79		E. S. E.	12	Mean Temperature, 70 9°
19	30.05	87	70	76		S. S. W.	24	Highest Temp. peral inc 96° on 2d
20	30.06	83	68	76		S. W.	15	Lowest Temperature, 70 3° on 25th
21	30.03	85	66	76		W. S. W.	15	Monthly Range of Temperature, 42°
22	30.04	91	68	80		S. W.	15	Greatest Daily Range of Temperature, 29° on 9 & 10
23	30.01	96	70	83		W. N. W.	15	Least Daily Range of Temperature, 24° on 6th.
24	30.16	86	62	74		E. S. E.	20	Mean Daily Range of Temperature, 20°
25	30.14	72	59	65		E. S. E.	5	Total Precipitation, .31 in.
26	29.98	86	67	77		E. S. E.	15	Mean Daily Relative Humidity, 69 per cent.
27	29.90	88	72	86		S. S. W.	15	Prevailing Direction of Wind, S. W.
28	30.00	96	64	77		W. S. W.	15	Number of Foggy Days, 0
29	30.07	81	67	74		S. W.	15	Number of Clear Days, 11
30	30.08	87	69	78		W. N. W.	15	Number of Fair Days, 8
	Total Means	30.00	80.6	60.6	70.9	63 per C	1.61 in	Number of Cloudy Days, 9

Average Mean Temperature for 2 years preceding 71 1°

\* Rain and Melted Snow.

Average Rainfall for 2 years preceding 3.78 in.

\* T indicates Trace of Precipitation.

## REMARKS.

Lunar corona, 12th.

Double Rainbow, 5th.

**Meteorological Observations taken at Newark, N. J., July 1894.**  
 BY PROF G. C. SONN, VOL OBSERVER, U. S. WEATHER BUREAU

DATE	Barometer	Daily Mean Temperature			Humidity	Prevailing Direction of Wind	Velocity Miles per Hour	Daily Precipitation*	GENERAL ITEMS		
		Max	Min	Mean					Max in in.	in.	in.
1	30.06	93	77	80.3	75%	S W	12	0.00			
2	30.05	95	75	80.5	75%	S W	20	0.00			
3	30.05	91	75	80.7	75%	S W	24	0.00			
4	30.03	93	79	80.0	75%	S W	24	0.00			
5	29.94	82	61	73.0	53%	W S W.	15	0.00			
6	29.93	72	61	68.8	87%	S S E.	15	1.07			
7	29.94	75	62	70.3	87%	S S E.	15	0.40			
8	29.94	75	62	70.3	87%	S S E.	15	0.00			
9	30.05	80	65	73.0	54%	Variable	10	0.00			
10	30.10	79	65	70.5	58%	S	10	0.00			
11	30.04	90	69	74.0	71%	W S W.	10	0.00			
12	29.97	87	77	80.0	67%	S W	12	1.0			
13	29.89	90	72	80.0	54%	S W.	30	0.00			
14	29.98	90	72	80.0	69%	N W.	—	0.17			
15	30.04	85	68	76.5	68%	S S W.	20	0.00			
16	30.1	80	65	72.5	82%	N W.	—	0.00			
17	30.17	85	63	74.0	72%	E S E.	10	0.00			
18	30.17	80	66	77.5	77%	S W	15	0.00			
19	30.12	93	75	84.5	59%	S W.	15	0.00			
20	29.95	55	41	53.0	57%	S W.	15	0.00			
21	29.78	93	71	80.0	65%	S W.	15	0.15			
22	30.00	66	62	64.0	57%	N N E.	20	0.00			
23	30.04	71	63	66.0	76%	N N E.	24	0.03			
24	29.96	85	63	73.0	76%	S W.	12	0.04			
25	30.09	92	65	78.5	63%	S W.	12	0.00			
26	30.19	93	71	82.0	69%	Variable	12	0.00			
27	30.14	90	71	80.5	76%	S S E.	12	0.00			
28	30.04	94	71	81.5	68%	S	15	1.30			
29	29.85	88	76	87.0	60%	S	25	0.01			
30	30.00	91	71	81.0	53%	W S W.	24	0.00			
31	30.05	89	71	80.0	74%	S W	15	0.03			
Total Means		30.01	86.1	86.4	71.2	67 per C		2.80 in			

\* T Indicates Trace of Precipitation.

\* Rain and Melted Snow

Mean Barometer 30.01 in. 760.  
 Highest Barometer 30.17 in. 760.  
 Lowest Barometer 29.55 in. 744.  
 Monthly Range of Barometer 1.62 in.  
 Mean Temperature 76.2°  
 Highest Daily Average 80.0° on July 2nd  
 Lowest Daily Average 68.0° on July 1st  
 Monthly Range of Temperature 12.0°  
 Greatest Daily Range of Temperature 12.0° on July 1st  
 Least Daily Range of Temperature 0.0° on July 2nd  
 Mean Daily Range of Temperature 1.0°  
 Total Precipitation 1.0 in.  
 Mean Daily Relative Humidity  
 Prevailing Direction of Wind, S. W.  
 Number of sunny Days 8  
 Number of Fair Days 3  
 Number of Cloudy Days 1  
 Number of Foggy Days 1  
 Total Number of Days 31  
 Thunder Storm, 6, 14, 20, 26, 29 and 31  
 Mean Max Temperature 86.1°  
 Mean Min Temperature 67.0°

**REMARKS.**

Shooting stars in quantity, 10th and 20th

The average Temperature of the month was above normal, ranking it probably the hottest July on record. The rainfall was about two inches below average, July being usually a wet month.

The Maximum Temperature on record for July is 90.5° It occurred in 1869.

The Maximum Temperature for July 1893 was 96.4°. The Minimum Temperature for July 1893 was 55°.

# Meteorological Observations taken at Newark, N. J., August 1894.

BY PROF G C SONN, VOL OBSERVER, U S. WEATHER BUREAU.

DATE.	DAILY MEAN	TEMPERATURE			DAILY MEAN PRESSURE INCHES	PREVAILING DIRECTION OF WIND	VELOCITY MILES PER HOUR	DAILY PRECIPITATION*	GENERAL ITEMS.
	BAROMETER	MAX.	MIN.	MEAN					
1	30.00	83	75	75.0	72.00°C	N. W.	1	0.00 in	Mean Barometer, 30.00 inches
2	29.93	84	71	74.0	74.00	S. E.	24	1.73	Highest Barometer, 30.23 inches.
3	29.84	85	69	77.0	81	W. N. W.	19	1.59	Lowest barometer, 29.79 inches.
4	29.65	78	60	69.0	73	N. W.	10	0.30	Monthly Range of Barometer, 0.422 inches
5	30.19	79	63	70.0	85	W. S. W.	10	0.00	Mean Temperature, 71.5°
6	29.56	84	57	71.0	71	S. E.	12	0.00	Highest Temperature, 90° on 24th
7	30.08	85	71	75.0	76	S. W.	7	1.00	Lowest Temperature, 53° on 23d
8	29.97	90	64	75.0	75	S. W.	8	1.00	Monthly Range of Temperature, 49°
9	29.92	90	67	75.0	85	S. W.	13	1.56	Greatest Daily Range of Temperature, 45° on 23d
10	29.69	79	57	68.0	69	N.	18	6.30	Least Daily Range of Temperature, 12° on 26th
11	29.94	80	57	69.0	55	N.	18	0.00	Mean Daily Range of Temperature,
12	29.69	81	54	67.0	76	N. W.	7	0.00	Total Precipitation, 2.65 in.
13	29.98	74	61	65.0	82	S. W.	6	0.00	Mean Daily Relative Humidity
14	29.66	88	69	70.0	82	E.	9	1.00	Predominant Direction of Wind, W. S. W.
15	29.93	83	66	75.0	81	S. S. W.	26	1.25	Number of Foggy Days, 6
16	29.84	86	69	70.0	71	S. S. W.	15	0.00	Number of Clear Days, 11
17	30.05	82	56	70.0	79	Variable	10	0.00	Number of Fair Days, 12
18	29.77	82	60	71.0	81	W. S. W.	12	0.00	Number of Cloudy Days, 8
19	29.95	95	63	73.0	78	S. S. E.	9	0.00	Total Number of Days on which Rain or Snow Fell, ..
20	29.91	78	64	71.0	86	N. W.	12	0.48	Thunder Storm, 3 1/2 and 5
21	29.68	74	68	69.0	48	N. W.	20	0.00	Mean Max. Temperature, 92.1°
22	29.72	84	53	75.0	75	W. S. W.	10	0.00	Mean Min. Temperature, 61.5°
23	29.17	90	57	74.0	72	S. S. W.	15	0.00	
24	29.72	79	62	71.0	61	S. W.	12	0.00	
25	30.04	84	65	75.0	71	S. W.	6	0.00	
26	29.97	84	68	74.0	73	N. W.	11	0.00	
27	29.71	74	59	68.0	66	N. W.	15	0.00	
28	29.62	74	58	66.0	78	S. W.	12	0.00	
29	29.66	70	58	66.0	71	N. W.	11	0.00	
30	29.92	83	71	72.0	67	S. W.	29	0.30	
31	29.62	77	59	66.0	62	W. S. W.	12	0.30	
Total Means		30.03	82.3	61.5	71.0	69.00°C		2.00 in	AUGUST 1893, gave rainfall, of

Average Temperature for two years previous to 1894  
\* Rain and Melted Snow

Average Precipitation for two years previous to 1894

\* T indicates Trace of Precipitation

## REMARKS.

The rainfall of July was 2.6 inches, of which .6 came in one shower on the 6th

June also was a dry month. The drought became marked in August. The country round about has not suffered so much since the phenomenal drought of 1893.

# Meteorological Observations taken at Newark, N. J., September 1894.

BY PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU.

DATE	DAILY MEAN TEMPERATURE			DAILY MEAN HUMIDITY	PREDOMINANT DIRECTION OF WIND	VELOCITY MILES PER HOUR	DAILY PRECIPITATION*	GENERAL ITEMS		
	DAILY MEAN BAROMETER:	MAX.	MIN.	MEAN	MAXIMUM	Precipitation*	Mean Barometer 30.11 inches			
1	30.11	76.4	59.9	68.2	S. W.	10	0.00 in	Highest Barometer, 30.58 inches on 13th.		
2	30.10	76.4	59.9	68.2	N. E.	10	0.00	Lowest Barometer, 29.64 inches.		
3	30.09	76.4	59.9	68.2	S. W.	10	0.00	Monthly Range of Barometer, 0.94 inches		
4	30.10	76.4	59.9	68.2	S. W.	10	0.00	Mean Temperature, 72°		
5	30.11	76.4	59.9	68.2	S. W.	12	0.00	Highest Temperature 94° on 10th.		
6	30.10	76.4	59.9	68.2	S. W.	12	0.00	Lowest Temperature, 42° on 26th		
7	30.09	76.4	59.9	68.2	S. W.	12	0.04	Monthly Range of Temperature, 42°		
8	30.09	76.4	59.9	68.2	S. W.	12	0.00	Greatest Daily Range of 1 Imperial re. 30° on 2d and 7th		
9	30.09	76.4	59.9	68.2	S. W.	12	0.00	Least Daily Range of Temperature, 8° on 18th		
10	30.09	76.4	59.9	68.2	S. W.	12	0.00	Mean Daily Range of Temperature, 16°		
11	30.09	76.4	59.9	68.2	S. W.	12	0.00	T. Lat. 41° 41' N. Long. 74° 11' W.		
12	30.09	76.4	59.9	68.2	S. W.	12	0.00	Mean Relative Humidity, 48 per cent		
13	30.09	76.4	59.9	68.2	S. W.	12	0.00	Prevailing Direction of Wind, S. W.		
14	30.09	76.4	59.9	68.2	S. W.	12	0.00	Number of Foggy Days, 0		
15	30.09	76.4	59.9	68.2	S. W.	12	0.00	Number of Gear Days, 10		
16	30.09	76.4	59.9	68.2	S. W.	12	0.00	Number of Fair Days, 3		
17	30.09	76.4	59.9	68.2	S. W.	12	0.00	Number of Cloudy Days, 7		
18	30.09	76.4	59.9	68.2	S. W.	12	0.00	Total Number of Days on Which Rain or Snow Fell, 7		
19	30.09	76.4	59.9	68.2	S. W.	12	0.00	Thunder Storm, 8, and 10		
20	30.09	76.4	59.9	68.2	S. W.	12	0.00	Mean Max. Temperature, 76.4		
21	30.09	76.4	59.9	68.2	S. W.	12	0.00	Mean Min. Temperature, 59.9°		
22	30.09	76.4	59.9	68.2	S. W.	12	0.00	REMARKS.		
23	30.09	76.4	59.9	68.2	S. W.	12	0.00	Cloud sun on 26th		
24	30.09	76.4	59.9	68.2	S. W.	12	0.00	September of 1893, gave Mean Temperature 64.6 degrees		
25	30.09	76.4	59.9	68.2	S. W.	12	0.00	Maximum 88 degrees. Minimum 44 degrees. Precipita-		
26	30.09	76.4	59.9	68.2	S. W.	12	0.00	tion 1.6.		
27	30.09	76.4	59.9	68.2	S. W.	12	0.00	September of 1893, gave Mean Temperature 62.7 degrees.		
28	30.09	76.4	59.9	68.2	S. W.	12	0.00	Maximum 88 degrees. Minimum 48 degrees. Precipita-		
29	30.09	76.4	59.9	68.2	S. W.	12	0.00	tion 2.6.		
30	30.09	76.4	59.9	68.2	S. W.	12	0.00	T indicates Trace of Precipitation.		
Total Means	30.11	76.4	59.9	68.2	S. W.	12	0.81 in			

Average Temperature for two previous years of

\* Rain and Melted Snow

Average Precipitation for two years previous,

in.

T indicates Trace of Precipitation.

# Meteorological Observations taken at Newark, N. J., October 1894.

BY PROF. G. C. SONN, VOL. OBSERVER U. S. WEATHER BUREAU.

DATE	Daily Mean	Temperature			Daily Mean	Prevailing	Velocity	Daily Precipitation *	GENERAL ITEMS		
	Barometer.				Humidity	Direction of Wind	Miles per Hour				
		Max	Min	Me'n							
1	29.95	71	58	61.5	60 p. c.	W S W	2	0 00 in	Mean Barometer, 29.95 inches.		
2	29.95	72	48	60.0	64	S W	10	0 00	Highest Barometer, 29.95 inches on 2d		
3	29.85	73	53	63.0	9	Variable	1	0 00	Lowest Barometer, 29.75 inches on 10th		
4	29.83	65	54	62.5	37	S W	15	0 00	Smallest Range of Barometer, 1.21 inches.		
5	29.78	64	55	62.5	60	W S W	36	0 00	Mean Temperature, 54.2°		
6	29.12	66	47	56.5	58	N W	25	0 00	Highest Temperature, 58° on 3d		
7	29.34	62	44	52.5	76	S E	6	0 00	Lowest Temperature, 44° on 10th		
8	29.5	68	44	56.1	82	S	20	0 00	Month's Range of Temperature, 32°		
9	29.82	63	52	57.5	51	N W	29	0 00	Least Daily Range of Temperature, 25° on 18th		
10	29.54	51	50	53.5	84	W	65	0 00	Least Daily Range of Temperature, 4° on 22d		
11	29.5	60	43	52.5	54	S W	40	0 00	Mean Daily Range of Temperature, 14°		
12	29.29	63	4	52.1	61	W S W	20	0 00	Total Precipitation, 5 in		
13	29.59	58	52	55.1	82	S S E	12	0 46	Mean Daily Relative Humidity, 74 per cent		
14	29.81	52	42	41.0	50	W	15	T	Prevailing Direction of Wind, S. W.		
15	29.5	52	35	45.1	48	W	33	0 00	Number of Foggy Days, 5		
16	29.86	62	37	49.7	53	S W	26	1 30	Number of Clear Days, 13		
17	29.50	41	30	30.5	50	W S W	35	0 00	Number of Fair Days, 16		
18	30.06	63	46	54.5	57	W	12	0 00	Number of Cloudy Days, 8		
19	30.9	64	41	54.5	4	S W	12	0 00	Total Number of Days on which Rain of Snow Fell, 11.		
20	30.14	70	37	58.5	54	S W	20	0 30	Thunder Storms		
21	30.20	63	46	54.5	50	S S E	12	1 00	Mean Max. Temperature, 55.5°		
22	30.32	58	34	56.7	51	N E	1	0 00	Mean Min. Temperature, 48.0°		
23	30.34	57	52	54.5	5	E	12	0 00			
24	30.38	57	51	54.0	9	N E	26	1 30			
25	30.06	56	47	51.5	36	N N W	23	0 77			
26	29.93	57	48	52.7	57	N N E	24	0 13			
27	30.6	54	45	54.5	16	S	0	0 00			
28	30.06	65	46	55.5	71	S S E	15	0 00			
29	30.0	65	55	60.1	57	N N E	20	T			
30	30.14	57	53	45.0	50	N N E	12	0 00			
31	29.77	63	49	56.1	85	W	35	1 02			
Total Means,		30.00	62.5	48.0	48.0		72	5 51 in			

Average Temperature for two previous years of  
\* Rain and Melted Snow.

Average Precipitation for two years previous. in. T indicates Trace of Precipitation.

## REMARKS.

October, 1893, had Mean Temperature of 54.2 degrees.  
Maximum 78.5 degrees, Minimum 35 degrees. Precipitation 6.61 in.

October, 1894, had Mean Temperature of 55.2 degrees.  
Maximum 78.4 degrees, Minimum 28.5 degrees. Precipitation 5.33 in.

**Meteorological Observations taken at Newark, N. J., November 1894.**

BY PROF. G. C. SONN, VOL. OBSERVER U. S. WEATHER BUREAU

DATE	Daily Mean Barometer	Temperature				Daily Mean Humidity	Precipitating Direction of Wind	Velocity Miles per Hour	Daily Precipitation*	ENGLISH	TEMS
		Max.	Min.	M.	n			Miles per hour			
1	30.108	31	24	24	7	81	N. W.	0	0.0 in	Mean Barometer, 30.108 inches	
2	30.107	32	25	25	7	81	S. W.	0	0.0 in	Highest Barometer, 30.723 inches, or 29	
3	30.106	32	25	25	7	81	S. W.	0	0.0 in	Lowest Barometer, 29.723 inches, or 28	
4	30.105	32	25	25	7	81	S. W.	0	0.0 in	Monthly Range of Barometer, 1.70 in.	
5	30.104	32	25	25	7	81	S. W.	0	0.0 in	Mean Temperature, 24°	
6	30.103	32	25	25	7	81	S. W.	0	0.0 in	High of Temperature, 24° on 2d	
7	30.102	32	25	25	7	81	S. W.	0	0.0 in	Lowest Temperature, 24° on 29th and 30th	
8	30.101	32	25	25	7	81	S. W.	0	0.0 in	Monthly Range of Temperature, 0°	
9	30.100	32	25	25	7	81	S. W.	0	0.0 in	Greatest Daily Range of Temperature, 21° on 2d	
10	30.099	32	25	25	7	81	S. W.	0	0.0 in	Least Daily Range of Temperature, 0° on 1	
11	30.098	32	25	25	7	81	S. W.	0	0.0 in	Mean Daily Range of Temperature, 0°	
12	30.097	32	25	25	7	81	S. W.	0	0.0 in	Total Precipitation, 3.68 in.	
13	30.096	32	25	25	7	81	S. W.	0	0.0 in	Mean Daily Relative Humidity, 72 per cent.	
14	30.095	32	25	25	7	81	S. W.	0	0.0 in	Precipitating Direction of Wind, W. S. W.	
15	30.094	32	25	25	7	81	S. W.	0	0.0 in	Number of Foggy Days, 0	
16	30.093	32	25	25	7	81	S. W.	0	0.0 in	Number of Clear Days, 12	
17	30.092	32	25	25	7	81	S. W.	0	0.0 in	Number of Rainy Days, 11	
18	30.091	32	25	25	7	81	S. W.	0	0.0 in	Number of Cloudy Days, 1	
19	30.090	32	25	25	7	81	S. W.	0	0.0 in	Total Number of Days on which Rain or Snow Fell, 12	
20	30.089	32	25	25	7	81	S. W.	0	0.0 in	Thunderstorms, 10th	
21	30.088	32	25	25	7	81	S. W.	0	0.0 in	Mean Max. Temperature, 46°	
22	30.087	32	25	25	7	81	S. W.	0	0.0 in	Mean Min. Temperature, 34°	
 <b>REMARKS.</b>											
First Snow in measurable quantity on 20th											
Parhelia and Solar Halos on 4th											
Meteoric explosion, 11.21 p.m. on 7th											
Total Means	30.108	46.2	34.1			81			0.0 in		

**REMARKS.**

First Snow in measurable quantity on 20th

Parhelia and Solar Halos on 15

Meteorite exhibition 11310

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Total Means 39.108  $\pm$  46.2  $\pm$  34.1  $\pm$  1.5

#### **Rain and Melted Snow**

# Meteorological Observations taken at Newark, N. J., December 1894.

BY PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

DATE	Daily Mean	Temperature.		Daily Mean	Prevailing	Velocity	Miles per Hour	Daily	GENERAL ITEMS
	R. Barometer	Max	Min	Me'n	Direction of Wind				
1	30 28	35	22	23 5	SW p. c.	S. W.	5	0 54 in.	Mean Barometer 30 147 inches
2	30 974	40	31	36 5	N. W.	12			Highest Barometer 30 972 inches on 2d.
3	30 222	41	32	36 5	SW	12			Lowest Barometer 29 210 on 27th.
4	30 692	42	28	35 1	SW	12			Mean Range of Barometer, 1 29 inches.
5	30 135	42	26	35 1	SW S. W.	6			Mean Temperature 35°
6	30 172	30	26	29 1	SW	12			Highest Temperature 56° on 15th and 17th
7	30 174	45	32	32 5	Var. n. o.	10			Lowest Temperature 6° on 29th.
8	30 284	45	38	38 1	Variable	16			Monthly Rate of Temperature 4°
9	30 372	4	35	39 5	W.	10			Greatest Daily Range of Temperature 29° on 6th.
10	30 271	37	32	34 5	N. E.	20			Least Daily Range of Temperature 4° on 8th and 10th.
11	30 275	36	29	34 5	S.	15			Mean Daily Range of Temperature 4°
12	30 621	32	28	31 5	SW N. W.	20			Total Precipitation 1 14 in.
13	30 856	45	42	43 5	W.	10			Mean Daily Precipitation 2 per cent.
14	30 175	45	38	41 5	S. W.	12			Prancing Days, 1, N. W. S. W.
15	30 137	54	40	47 0	SW	16			Number of Foggy Days, 3
16	30 08	50	36	43 0	S.	12			Number of Cloudy Days, 3
17	30 94	54	40	47 0	S. W.	14			Number of Rainy Days, 14
18	30 34	42	34	34 0	N. W.	30			Number of 10-day Days, 1
19	30 211	43	29	36 0	S.	10			Total Number of Days on which Rain or Snow Fall, 12
20	30 127	47	39	38 0	S. W.	8			Thunder Storm
21	30 294	47	30	38 5	Var. b.	8			Mean Max. Temperature, 41°
22	30 11	51	34	43 0	S. W.	10			Mean Min. Temperature, 29°
23	30 447	31	23	27 0	W. N. W.	10			
24	30 344	35	26	27 5	Variable	12			
25	30 065	43	30	33 5	S. W.	40			
26	30 328	31	23	27 2	N. E.	35			
27	30 650	34	26	25 5	W. N. W.	4			1 66 R & S
28	30 174	17	1	12 0	W. N. W.	4			
29	30 127	29	1	12 0	W.	24			
30	30 165	27	16	21 0	S. W.	12			
31	30 186	32	24	24 0	W. N. W.	12			
Total Means		30 145	40 9	29 3	35 0°	73 p. c.		4 61 in.	

Average Temperature for two previous years of  
\* Rain and Melted Snow

Average Precipitation for two years previous.

In  
and rates of precipitation

## REMARKS.

Total Snowfall for the month, 5.75 inches.

## SUMMARY FOR 1894.

MONTH	MAXIMUM	MINIMUM	MEAN	PRECIPITATION	SNOW
	TEMPERATURE	TEMPERATURE	TEMPERATURE		
January	55°	15°	34.5°	1.92 in. h	7.6 inch
February	42°	1°	23.4°	5.10 "	13.42 "
March	51°	19°	44°	1.94 "	Trace
April	73°	24°	49.6°	2.62 "	2.11 inch
May	83°	41°	61.3°	4.13 "	
June	90°	47°	71.5°	1.3 "	
July	98°	58°	74.8°	2.6 "	
August	91°	58°	71.9°	2.46 "	
September	94°	42°	68.7°	5.8 "	
October	78°	37°	55.4°	5.18 "	
November	64°	21°	40.8°	8.98 "	
December	54°	6°	25.1°	4.1 "	1.8 in. h

Total Precipitation, Rain and Melted Snow  
Total Snowfall.

Maximum Temperature for the year, 98 degrees.  
Minimum " " " " 1 "  
Mean " " " " 58 "  
Range of Temperature " "

January, March, April, May, June, September, October and December were above normal in temperature; February and November below; while July and August were about normal.

The year's rainfall was short of the average by six inches. The following months were deficient. January, March, April, June, July and August.

GEO. C. SONN,  
*Voluntary Observer U. S. Weather Bureau.*

**AREA OF CITY AND EXTENT OF PUBLIC  
IMPROVEMENTS.**

Census population, 1890.....	181,830
Estimated population .....	203,923
Total area of the city, square miles .....	18
Built up portion, square miles.....	12
Meadow land, square miles .....	6
Length of river and bay front, miles.....	10 5
Number of miles of Stone block.....	29 25
Number of miles Telford pavement.....	10 94
Number of miles of Cobble stone pavement.....	20 67
Number of miles of Asphalt pavements in streets....	4 18
Total length of paved streets .....	65 04
Number of miles of unpaved streets ... ..	139 06
Length of Electric Railways, miles..	50 00
Length of Steam Railways, miles .. .	28 38
Length of Brick Sewers, miles ..	53 49
Length of Pipes, Sewers, miles, ..	58 55
Total length of Sewers ..	112 04
Length of Water Mains, miles .. .	204 03
Average daily consumption of Water during the month, gallons, about .. .	18,000,000
Capacity of Water supply, per day, gallons. ..	50,000,000
Number of Buildings .. .	26,928



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[FORM B.]

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[FORM P., A. P. H.]

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